HORIZON

AIR MEASUREMENT SERVICES, INC.

Horizon Test #: W07-035-FRA
Date Tested: April 23, 2003
Report Date: May 7, 2003
Revision Number: 0

ANNUAL EMISSIONS TEST OF LANDFILL GAS FLARE #1 BRADLEY LANDFILL

Permit to Construct No. 370136

Prepared for:

Waste Management Recycling and
Disposal Services of California, Inc.
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Sun Valley, California 91352

Prepared by:

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HORIZON
AIR MEASUREMENT SERVICES, INC.

May 7, 2003

Mr. Bruce Matlock
Bradley Landfill and Recycling Center
9227 Tujuna Avenue
Sun Valley, California 91352

Dear Mr. Matlock:

Please find enclosed three copies of the final report entitled "Annual Emissions Test of Landfill Gas Flare #1".

If you have any questions please call me at (805) 498-8781.

Sincerely,

HORIZON AIR MEASUREMENT SERVICES, INC.

Scott H. Bunch

Scott H. Bunch
Project Manager

SB:rt

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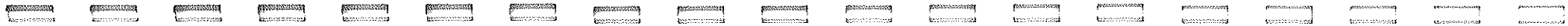
TABLE OF CONTENTS



1. INTRODUCTION

Under the Bradley Landfill and Recycling Center (BLRC) site specific Rule 1150.1 compliance plan, Waste Management Recycling and Disposal Services of California, Inc. is required to conduct an annual source test on landfill gas Flare #1 located at BLRC (Permit to Construct #370136). Horizon Air Measurement Services, Inc. (Horizon) had been retained for this purpose.

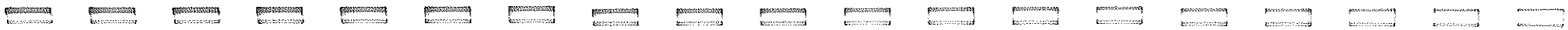
All testing/analytical procedures conformed to those outlined in Horizon Test Plan No. W07-013-TP, which had been previously approved by the South Coast Air Quality Management District (SCAQMD). Horizon completed the source testing on April 23, 2003.

Two samples were taken for each parameter of interest (Table 1-1) with the exception of trace organic compounds and reduced sulfur compounds, for which only one sample per location was collected. The results of the testing program, with respect to Permit limits, are provided in Section 2 - Results Summary.

A brief description of the flare and flare operating conditions during testing is provided in Section 3. Section 4 provides a summary of sampling/analytical procedures utilized. Section 5 provides a more detailed results summary/discussion.

Table 1-1
Compounds of Interest - Flare #1
Waste Management - Bradley Landfill
April 23, 2003

Parameter	Location	Method	Number of Samples Per Source
Total Non Methane Hydrocarbons	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 25.3	2
Reduced Sulfur Compounds (C_1-C_3) Including H_2S	Inlet	SCAQMD Method 307.91 Equivalent	1
Speciated Organic Compounds	Inlet	Whole Air/GC-MS (1150 list)	1
	Outlet	Whole Air/GC-MS (1150 list)	1
Particulate Matter	Outlet	SCAQMD Method 5.1	2
Oxides of Nitrogen	Outlet	SCAQMD Method 100.1	2
Carbon Monoxide	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 100.1	2
Oxygen	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 100.1	2
Carbon Dioxide	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 100.1	2
Methane	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 25.3	2
Flow Rate/Temperature	Inlet	SCAQMD Method 2.3	2
	Outlet	SCAQMD Method5.1/Calculated	2
Moisture	Outlet	SCAQMD Method 5.1	2
	Inlet	SCAQMD Method 4.1	2
BTU Content	Inlet	SCAQMD Method 25.1	2



2. SUMMARY OF RESULTS

The results of the testing program conducted on Flare #1 are provided in Table 2-1. Emission rates of oxides of nitrogen, carbon monoxide, total particulate matter, total non-methane organics and total sulfur compounds (as SO_2) were within PTC 370136 (see Appendix H) limitations.

A more detailed discussion of results is provided in Section 5.

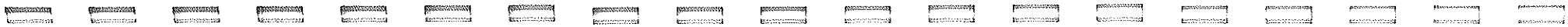


Table 2-1
Summary of Results
Flare #1
Waste Management - Bradley Landfill
April 23, 2003

Parameter	Measured Emission Rate*	Permitted Emission Rate
Inlet Gas Flow Rate	3531 dscfm	5556 cfm
Oxides of Nitrogen, as NO_2	2.48 lb/hr 0.030 lb/MMBtu	10.0 lb/hr, 0.06 lb/MMBtu
Total Particulate Matter	0.53 lb/hr	3.0 lb/hr
Carbon Monoxide	<3.75 lb/hr	33.3 lb/hr
Total Non Methane Organics, as CH_4	0.295 lb/hr	1.86 lb/hr
Total Non Methane Organics, as C_6	1.20 ppm C_6 @ 3% O_2	20 ppm C_6 @ 3% O_2 (Rule 1150.1)
Total Sulfur Compounds, as SO_2	2.25 lb/hr	8.44 lb/hr

* Measured emission rates shown are the average of two test runs (samples).

3. FLARE DESCRIPTION AND OPERATION

3.1 Flare Description

The landfill gas flare is a John Zink enclosed flare consisting of an insulated steel cylinder 60 feet high and 156 inches outside diameter. The flare is equipped with a multi-jet burner, a propane gas pilot, electric igniter, UV flame sensor, thermocouple with temperature indicator and recorder, automatic shutdown and alarm system, automatic combustion air regulating system, temperature controller and flare arrestor. Landfill gas is supplied by a 200 horsepower (Hp) blower (one blower is standby). Operating landfill gas flow rate is limited, by the Permit, to 5556 cubic feet per minute. Landfill gas flow rate was continuously monitored using an annubar and is recorded digitally by the facility. Flare temperature and condensate injection rate was also continuously monitored by the facility.

Condensate flow rate is limited to five gallons per minute by the Permit.

3.2 Sample Location

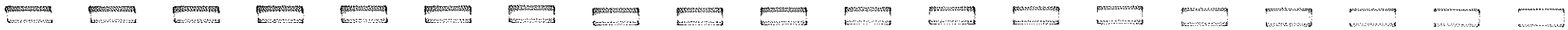
Flare exhaust samples were obtained from each of two ports positioned at right angles, located five feet (0.4 diameters) from the top of the flare (144 inches inside diameter) and approximately 55 feet (4.6 diameters) above ground level.

Inlet samples and measured flow rate were obtained from the 14-inch diameter (13.25 inch inside diameter) landfill gas line supplying the flare at a location 144 inches (10.9 diameters) downstream and 93 inches (7.0 diameters) upstream of any flow disturbance.

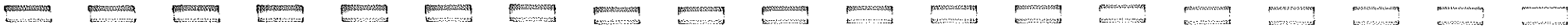
3.3 Flare Operation During Testing

The following operating condition set points were maintained during the emissions testing:

Flare Temperature Set Point -	1650 °F
Landfill Gas Flow Rate -	3600 scfm
Condensate Injection Rate -	3.5 gpm



The condensate injection operated in the normal automatic mode. Flare process data is provided in Appendix G.



4. SAMPLING/ANALYSES

The sampling/analytical program had been designed to quantify the parameters of interest outlined in Table 1-1.

4.1 Sample Location

4.1.1 Flare Exhaust

At the flare exhaust 24 sample points (12 per diameter), determined in accordance with Method 1.1, were utilized for the determination of the following compounds:

- particulate matter
- NO_X
- CO
- O_2/CO_2
- flow rate
- moisture

The exact locations of the sampling points are provided in Appendix D, Field Data Sheets. A description of SCAQMD Method 1.1 is provided in Appendix A.

One sample point near the center of the stack was utilized for the collection of the following compounds:

- speciated organic compounds
- total non methane hydrocarbons
- methane

4.1.2 Landfill Gas Supply Line

Twelve sample points (six per diameter), determined in accordance with Method 1.1, were used for collection of the following parameter:

- flow rate

The exact locations of the sampling points are provided in Appendix D, Field Data Sheets. A description of SCAQMD Method 1.1 is provided in Appendix A.

A single sample point was utilized for the collection of the following compounds:

- total non methane hydrocarbons
- methane
- CO
- CO_2/O_2
- reduced sulfur compounds
- speciated organic compounds
- BTU content
- moisture

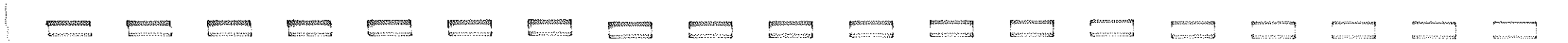
4.2 Moisture

4.2.1 Inlet - SCAQMD Method 4.1

Landfill gas moisture content was determined using SCAQMD Method 4.1. Two, one hour test runs were conducted in conjunction with the outlet particulate and SCAQMD Method 100 testing. A description of SCAQMD Method 4.1 is provided in Appendix A.

4.2.2 Outlet - SCAQMD Method 5.1

Moisture content of the flare exhaust was determined using SCAQMD Method 4.1 in conjunction with SCAQMD Method 5.1, as detailed in Appendix A.



4.3 Flow Rate

4.3.1 Inlet - SCAQMD Method 2.3

Landfill gas flow rate was determined using SCAQMD Method 2.3. A description of SCAQMD Method 2.3 is provided in Appendix A.

4.3.2 Outlet - SCAQMD Method 5.1

The landfill flare flow rate was monitored in conjunction with SCAQMD Method 5.1, as detailed in Appendix A. However, since the flare exhaust velocity was below the applicable limit (0.05 in. WG ΔP) of SCAQMD Method 2.1/5.1, the exhaust flow rate was calculated stoichiometrically based upon the landfill gas composition and stack dilution.

4.4 Particulate Matter (Outlet) - SCAQMD Method 5.1

Horizon conducted two, 60-minute test runs on the flare exhaust for particulate matter determination in accordance with SCAQMD Method 5.1 protocol. Twenty-four traverse points were utilized for the collection of particulate matter at the flare exhaust. A description of SCAQMD Method 5.1 is provided in Appendix A. Stack gases were withdrawn through an integral quartz nozzle and probe.

4.5 Oxides of Nitrogen, Carbon Monoxide, Carbon Dioxide, Oxygen (Continuous Emissions Monitoring) - SCAQMD Method 100.1

Two, 60-minute test runs were conducted at the flare exhaust. Twenty-four sample points were utilized. All sampling was performed under the guidelines of SCAQMD Method 100.1 as detailed in Appendix A.

4.6 Hydrogen Sulfide (H_2S), and C_1 - C_3 Sulfur Compounds (Inlet) - SCAQMD Method 307.91 Equivalent

Hydrogen sulfide and C_1 - C_3 sulfur compound samples were collected at the inlet of the flare using the Tedlar bag collection system depicted in Appendix A. All system components coming in contact with the landfill gas were Teflon.

Hydrogen sulfide and C_1 - C_3 sulfur compounds were analyzed using a Method 307.91 equivalent by AtmAA, Inc. Equivalency had been formally granted by SCAQMD to AtmAA, Inc. for this Method.

4.7 Speciated Organic Compounds - SCAQMD Rule 1150.1 List

4.7.1 Inlet

Speciated organic compounds were collected at the flare inlet of the landfill gas using the Tedlar bag collection system depicted in Appendix A. All system components coming in contact with the landfill gas were Teflon or stainless steel. Speciated organic compounds (SCAQMD Rule 1150.1 list) were identified and quantified using GC/MS analytical procedures.

4.7.2 Outlet

Speciated organic compound samples were collected in conjunction with the particulate/CEM testing at the outlet using the Tedlar bag method depicted in Appendix A. Each sample was then analyzed for speciated organic compounds (SCAQMD Rule 1150.1 list) using GC/MS procedures.

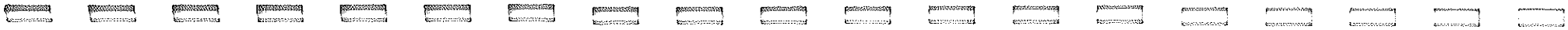
4.8 Total Non Methane Hydrocarbons, Methane, Carbon Dioxide and Carbon Monoxide

4.8.1 Inlet - SCAQMD Method 25.1

Total non methane hydrocarbons, methane, CO_2 and CO concentration were determined at the flare inlet from duplicate samples using SCAQMD Method 25.1. A description of SCAQMD Method 25.1 is provided in Appendix A.

4.8.2 Outlet - SCAQMD Method 25.3

Duplicate samples were obtained for total non methane hydrocarbon and methane concentration determination using SCAQMD Method 25.3. A description of SCAQMD Method 25.3 is provided in Appendix A.



5. RESULTS DISCUSSION

Detailed results of the criteria testing conducted on Flare #1 on April 23, 2003 are presented in Table 5-1. Speciated organic compound destruction efficiencies and emission rates are provided in Table 5-2. Since the flare exhaust velocity was below the applicable range (>0.05 ΔP inches water gauge) of SCAQMD Method 2.1, the flare exhaust flow rate for each test run was calculated stoichiometrically based upon the composition of the landfill gas and the exhaust stack dilution. Oxide of sulfur emission rate was calculated based upon the landfill gas total sulfur compound concentration and flow rate (see Appendix B).

Test Critique

No sampling or analytical problems or Method deviations were encountered during any phase of the test program.

Table 5-1
Summary of Results
Waste Management - Bradley Landfill
Flare #1
April 23, 2003

	LANDFILL GAS			FLARE EXHAUST		
Run Number	1	2	Avg.	1	2	Avg.
STACK GAS CHARACTERISTICS						
Temperature, degrees F	141	143	142	1526	1523	1524
Moisture, %	5.3	6.6	6.0	9.2	9.6	9.4
Flow Rate, acfm	4334	4367	4350			
Flow Rate, dscfm	3549	3514	3531	41134 *	43527 *	42330 *
Fixed Gases						
Oxygen, %	2.82	-	2.82	13.78	14.24	14.01
Carbon Dioxide, %	33.50	-	33.50	6.46	6.08	6.27
Methane, %	39.05	-	39.05	0.00	0.00	0.00
BTU Value, Btu/scf	394	-	394	-	-	-
EMISSIONS						
Oxides of Nitrogen						
ppm	-	-	-	8.5	7.7	8.1
ppm @ 3 % O2	-	-	-	21.3	20.6	20.9
lb/hr	-	-	-	2.532	2.427	2.479
lb/MMBtu	-	-	-	0.030	0.029	0.030
Carbon Monoxide						
ppm	-	-	-	< 20.0	< 20.0	< 20.0
ppm @ 3 % O2	-	-	-	< 50.3	< 53.7	< 52.0
lb/hr	-	-	-	< 3.64	< 3.85	< 3.75
lb/MMBtu	-	-	-	< 0.04	< 0.05	< 0.04
Total Particulate Matter						
gr/dscf	-	-	-	0.0015	0.0014	0.0015
lb/hr	-	-	-	0.51	0.54	0.53
Total Non-Methane Hydrocarbons (Reactive Organic Compounds)						
ppm, as Methane	10187	-	10187	2.76	-	2.76
lb/hr, as Methane	90.93	-	90.93	0.295	-	0.295
Sulfur Compounds						
Hydrogen Sulfide, ppm	48.4	-	48.4	0.50	-	0.50
Total Sulfur, ppm as H2S	62.8	-	62.8	-	-	-
Oxides of Sulfur**						
lb/hr	-	-	-	2.25	-	2.25

* Flow Rate calculated stoichiometrically
** Calculated from sulfur balance

Table 5-2
Trace Organic Species
Destruction Efficiency Results
Waste Management - Bradley Landfill
Flare #1
April 23, 2003

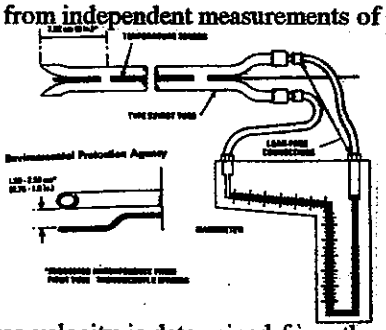
Species	Inlet		Outlet		Destruction Efficiency (%)
	Concentration (ppb)	Emission Rate (lb/hr)	Concentration (ppb)	Emission Rate (lb/hr)	
Hydrogen Sulfide	48400	9.21E-01	< 500	< 1.14E-01	> 87.62
Benzene	2890	1.26E-01	< 0.3	< 1.57E-04	99.88
Benzychloride	< 40	< 2.84E-03	< 0.8	< 6.80E-04	> NA
Chlorobenzene	211	1.33E-02	< 0.3	< 2.27E-04	> 98.30
Dichlorobenzenes	1480	1.21E-01	< 1.1	< 1.08E-03	> 99.11
1,1-dichloroethane	796	4.40E-02	< 0.3	< 1.99E-04	> 99.55
1,2-dichloroethane	134	7.41E-03	< 0.3	< 1.99E-04	> 97.32
1,1-dichloroethylene	162	8.77E-03	< 0.3	< 1.95E-04	> 97.78
Dichloromethane	5300	2.52E-01	< 0.3	< 1.71E-04	> 99.93
1,2-dibromoethane	< 16	< 1.68E-03	< 0.3	< 3.77E-04	NA
Perchloroethene	3320	4.39E-01	< 0.2	< 3.17E-04	> 99.93
Carbon tetrachloride	< 20	< 1.72E-03	< 0.2	< 2.06E-04	> NA
Toluene	66200	3.40E+00	< 0.8	< 4.93E-04	> 99.99
1,1,1-trichloroethane	59	4.40E-03	< 0.2	< 1.78E-04	> 95.95
Trichloroethene	1380	1.01E-01	< 0.2	< 1.75E-04	> 99.83
Chloroform	< 16	< 1.06E-03	< 0.2	< 1.59E-04	> NA
Vinyl Chloride	454	1.58E-02	< 0.3	< 1.25E-04	> 99.21
m xylenes	29800	1.76E+00	< 0.5	< 3.55E-04	> 99.98
o- p xylene	7730	4.57E-01	< 0.3	< 2.13E-04	> 99.95
TNMHC	10187217	9.10E+01	2755	2.95E-01	99.68

Note: All values preceded by "<" are below the detection limit - reported values are detection limit values.
NA--Not applicable: Destruction efficiency cannot be calculated since both inlet and outlet values are below the detection limit.

APPENDIX A - Sampling and Analytical Methods

Method:	**Sample Velocity Traverses for Stationary Sources**
Applicable for Methods:	EPA Method 1, SCAQMD Method 1.1, CARB Method 1
Principle:	To aid in the representative measurements of pollutant emissions and/or total volumetric flow rate from a stationary source, a measurement site where the effluent stream is flowing in a known direction is selected, and the cross section of the stack is divided into a number of equal areas. A traverse point is then located within these equal areas. The method cannot be used when, 1) flow is cyclonic or swirling, 2) stack is small than about 0.30 meter (12 inches) in diameter or 3) the measurement of the site is less than two stack or duct diameters downstream or less than a half diameter upstream from the flow disturbance.

Method:	**Stack Gas Velocity and Volumetric Flow Rate**
Applicable for Methods:	EPA Method 2, CARB 2, SCAQMD Method 2.1
Principle:	The average gas velocity in a stack gas is determined from the gas density and from measurement of the average velocity head with a type S or standard pitot tube.
Sampling Procedure:	Set up the apparatus as shown in the figure. Measure the velocity head and temperature at the traverse points specified by EPA Method 2, CARB Method 2 or SCAQMD Method 2.1. Measure the static pressure in the stack and determine the atmospheric pressure. The stack gas molecular weight is determined from independent measurements of O_2, CO_2 and H_2O concentrations.



Sample Recovery: and Analyses:	The stack gas velocity is determined from the measured average velocity head, the measured dry concentrations of O_2 and CO_2 and the measured concentration of H_2O. The velocity is determined from the following set of equations:

Where,

ΔP = velocity head, inches in H_2O
Ts = gas/temperature, degrees R
Ps = absolute static pressure
Mwd = dry molecular weight
Mw = molecular weight
Cp = pitot flow coefficient

Dry molecular weight of stack gas

$$Mwd = 0.44\ (\%CO_2) + 0.32\ (\%O_2) + 0.28\ (\%N_2 + \%CO)$$

Molecular weight of stack gas, wet basis

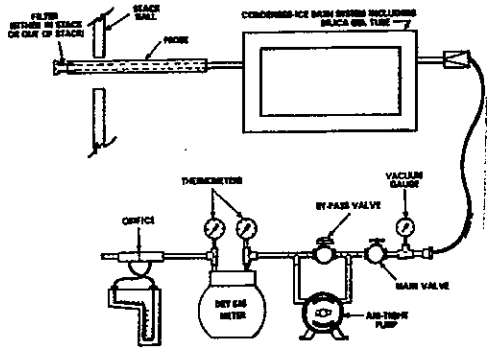
$$M_w = (M_{wd}\ x\ M_d) + 18\ (1 - M_d)$$

$$Where,\ M_d = \frac{100 - Bws}{100}$$

Stack gas velocity

$$(V_s)\ avg. = (5130)\ C_p\ x\ \sqrt{\Delta P}\ avg.\ x\ \sqrt{T_s}\ x\ \left(\frac{1}{P_s\ x\ M_w}\right)^{1/2}$$

Method:	**Determination of Moisture in Stack Gases**
Applicable for Methods:	EPA Method 4, ARB 1-4, SCAQMD Method 4.1
Principle:	A gas sample is extracted at a constant rate from the source; moisture is removed from the stream and determined either volumetrically or gravimetrically.
Sampling Procedure:	Set up train as shown in the following figure. Sample is drawn at a constant rate through a sufficiently heated probe. The probe is connected to the impinger train by Teflon or glass tubing. The train consists of two greenburg smith impinger (SCAQMD 4.1) or one modified and 1 greenburg smith impinger (CARB & EPA) each containing 100 ml of water, an empty impinger as a knock-out and an impinger containing silica gel to protect the pump from moisture.



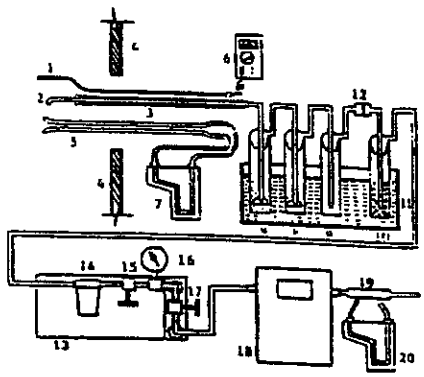
Sample Recovery: and Analyses:	Following testing, moisture content is determined gravimetrically or volumetrically from initial and final impinger contents weights or volume.

Method: **Determination of Particulate Matter Emissions From Stationary Sources Using a Wet Impingement Train**

Reference: SCAQMD Method 5.1

Principle: Stack gas is withdrawn isokinetically from the source through a sample train. Particulate matter is collected in impingers containing deionized water and on a back-up filter. The impingers are contained in an ice bath to maintain a sampled gas temperature of approximately 15° C (60° F). The filter is not heated.

Sampling Procedure: The sampling train is shown in the figure below. The sample is drawn isokinetically through a glass or quartz probe (hi-temp). The probe is connected to an impinger train by Teflon tubing. The train consists of two Greenburg-Smith impingers which contain 100 ml of DI water; an empty impinger as a knock-out; and an impinger containing silica gel to protect the pump from moisture. Sample is withdrawn isokinetically from each predetermined sample point (determined using SCAQMD Method 1.1) through the sample train, which is followed by a vacuum line, a pump, a dry gas meter and a calibrated orifice.



1. Temperature Sensor
2. Nozzle
3. Glass Lined Stainless Steel Probe
4. S-type Pitot Tube
5. Stack Wall
6. Temperature Sensor Meter
7. Pitot Tube Inclined Manometer
8. Impinger with 100 ml H_2O
9. Empty Bubbler
10. Bubbler with Silica Gel
11. Ice Bath
12. Filter
13. Sealed Pump (Leak Free)
14. Filter for Pump
15. Metering Valve
16. Vacuum Gauge
17. By-pass Valve
18. Temperature Compensated Dry Gas Meter
19. Orifice

Sample Recovery: The moisture content is determined either gravimetrically or volumetrically from initial and final impinger weights or volume. Then the filter, probe/impinger rinse (including nozzle rinse, liner rinse, impinger contents and rinses) and silica gel are recovered into Containers #1, #2 and #3, respectively.

Analytical Procedure: The aqueous sample is filtered through a tared fiberglass filter. An organic extraction is performed on the resulting solution using methylene chloride. Both the extraction filter and sample train filter are desiccated then measured gravimetrically. The organic extract and aqueous catch are evaporated, desiccated and measured gravimetrically.

If significant levels of sulfur compounds are present in the stack, each sample fraction is analyzed by acid-base titration for acid sulfate content and by barium-thorin titration for sulfate content.

Method:	**Determination of Total Gaseous Non-Methane Organic Emissions as Carbon**
Reference:	SCAQMD Method 25.1
Principle:	A sample of flue gas is drawn through a condensate trap and into an evacuated 12 liter tank. Volatile organic compounds (VOC), as total gaseous non-methane organics (TGNMO), are determined by combining results from independent analysis of condensate in the traps and gases in the tanks.
Sampling Procedure:	Duplicate gas samples are withdrawn from a source at a constant rate through condensate traps immersed in dry ice followed by evacuated 12 liter (nominal) tanks. Heavy organic components condense as liquids and solids in the condensate traps. Lighter components pass as gases through the traps into the tanks. The combined results from tanks and trap analyses are used to determine a qualitative and quantitative expression of the effluent gas stream. Duplicate sampling is designed into the system to demonstrate precision. The sampling apparatus is checked for leaks prior to the sampling program by attaching the probe end to an absolute pressure gauge and vacuum pump in series. The sample lines were evacuated to less than 10 mm Hg and the gauge shutoff valve is then closed. The sample lines are deemed to be leak-free if no loss of vacuum occurs as indicated by the vacuum gauge. During sampling the tank pressures are monitored with a 0-30 inch vacuum gauge to ensure integrated sampling. The final vacuum of each sample is measured using a slack tube manometer. The sample is then pressurized to 800 mm Hg absolute with ultrapure nitrogen. Each sample is then analyzed using the SCAQMD TCA procedure for total non methane hydrocarbons.
Analytical Procedure:	Condensate traps are analyzed by first stripping carbon dioxide (CO_2) from the trap. The organic contents are then removed and oxidized to CO_2. This CO_2 is quantitatively collected in an evacuated vessel and measured by injection into a flame ionization detection/total combustion analysis (FID/TCA) system. The organic content of the sample fraction collected in each tank is measured by injecting a portion into the FID/TCA analysis system which uses a two phase gas chromatography (GC) column to separate carbon monoxide (CO), methane (CH_4) and carbon dioxide (CO_2) from each other and from the total gaseous non-methane organics (TGNMO) which are eluted as backflush. All eluted components are first oxidized to CO_2 by a hopcalite catalyst and then reduced to methane by a nickel catalyst. The resulting methane is detected using the flame ionization detector. A gas standard containing CO, CH_4, CO_2 and propane, traceable to NBS, is used to calibrated the FID/TCA analysis system.

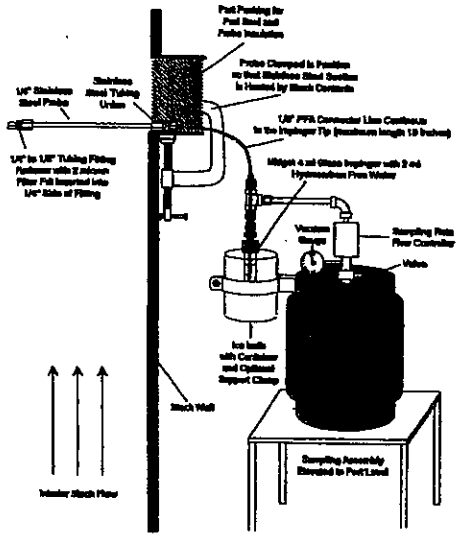
Method: **Determination of Total Gaseous Non-Methane Organic Emissions as Carbon**

Reference: SCAQMD Method 25.3

Principle: A sample of flue gas is drawn through a condensate trap (mini-impinger) and into an evacuated six liter SUMMA canister. Volatile organic compounds (VOC), as total gaseous non-methane organics (TGNMO), are determined by combining results from independent analysis of condensate in the traps and gases in the SUMMA canisters.

Sampling Procedure: Duplicate gas samples are withdrawn from a source at a constant rate through condensate traps immersed in an ice bath followed by evacuated six liter (nominal) SUMMA canisters. Heavy organic components condense as liquids and solids in the condensate traps. Lighter components pass as gases through the traps into the canisters. The combined results from canisters and mini-impinger analyses are used to determine a qualitative and quantitative expression of the effluent gas stream. Duplicate sampling is designed into the system to demonstrate precision.

The sampling apparatus is checked for leaks prior to the sampling program by capping the end of the sample probe. The sample flow valve is then opened and then closed to introduce vacuum to the system. The vacuum drop should then cease numerically above 10 in. Hg. A cease in movement of the vacuum gauge for a period of ten minutes indicates an acceptable leak check. When sampling is initiated, the vacuum gauge must indicate a canister vacuum of greater than 28 in. Hg. Immediately after sampling a post-test leak check is performed, followed by a rinse of the PFA line into the condensate trap with 0.5 to 1.0 ml of hydrocarbon free water.



Analytical Procedure: Condensate traps are analyzed for total organic carbon by liquid injection into an infrared total organic carbon analyzer.

The organic content of the sample fraction collected in each canister is measured by injecting a portion into the FID/TCA analysis system which uses a two phase gas chromatography (GC) column to separate carbon monoxide (CO), methane (CH_4) and carbon dioxide (CO_2) from each other and from the total gaseous non-methane organics (TGNMO) which are eluted as backflush. All eluted components are first oxidized to CO_2 by a hopcalite catalyst and then reduced to methane by a nickel catalyst. The resulting methane is detected using the flame ionization detector. A gas standard containing CO, CH_4, CO_2 and propane, traceable to NBS, is used to calibrated the FID/TCA analysis system.

CONTINUOUS EMISSIONS MONITORING SYSTEM - TRUCK

SCAQMD Method 100.1

The continuous emissions monitoring system consists of a Thermo Electron Model 10AR chemiluminescence NO/NO_X analyzer, a Teledyne electro chemical O_2 analyzer, a Thermo Electron Model 48H CO gas filter correlation analyzer and a Horiba PIR 2000 non dispersive infrared CO_2 analyzer. All analyzer specifications are provided in Table 1. All concentrations are determined on a dry basis. Concentrations of NO_X, CO, O_2 and CO_2 are continuously recorded on a Linseis 10-inch strip chart recorder and a Strawberry Tree Data Acquisition System (DAS). The extractive monitoring system conforms with the requirements of SCAQMD Method 100.1.

The sampling probe (heated to 250°F), constructed of 1/2 inch-diameter 316 stainless steel, is connected to a condenser with a six foot length of 3/8 inch Teflon line (heated to 250°F). A Nupro stainless steel filter (10 micron) is connected at the tip of the probe and maintained at stack temperature.

The condenser consists of a series of two stainless steel moisture knock-out bottles immersed in an ice water bath. The system is designed to minimize contact between the sample and the condensate. Condensate is continuously removed from the knock-out bottles via a peristaltic pump. The condenser outlet temperature is monitored either manually at 10-minute intervals or on a strip chart recorder/DAS system. The sample exiting the condenser is then transported through a filter, housed in a stainless steel holder, followed by 3/8 inch O.D. Teflon tubing and a Teflon coated (or stainless steel/viton) diaphragm pump to the sample manifold. The sample manifold is constructed of stainless steel tubing and directs the sample through each of five rotameters to the NO_X monitor, O_2 monitor, CO monitor, CO_2 monitor and excess sample exhaust line, respectively. Sample flow through each channel is controlled by a back pressure regulator and by stainless steel needle valves on each rotameter. All components of the sampling system that contact the sample are composed of stainless steel, Teflon or glass.

The calibration system is comprised of two parts: the analyzer calibration and the system bias check. The calibration gases are, at a minimum, certified to $\pm$ 1% by the manufacturer. Where necessary to comply with the reference method requirements, EPA Protocol 1 gases are used. The cylinders are equipped with pressure regulators which supply the calibration gas to the analyzers at the same pressure and flow rate as the sample. The selection of zero, span or sample gas directed to each analyzer is accomplished by operation of the zero, calibration or sample selector knobs located on the main flow control panel.

For SCAQMD Method 100.1 testing, the following procedures are conducted before and after each series of test runs:

Leak Check:

The leak check is performed by plugging the end of the sampling probe, evacuating the system to at least 20 inches of Hg. The leak check is deemed satisfactory if the system holds 20 inches of Hg vacuum for five minutes with less than one inch Hg loss.

Linearity Check:

The NO_X, CO, CO_2 and O_2 analyzers linearity check is performed by introducing, at a minimum, zero gas, mid range calibration gas (40-60% scale) and high range calibration gas (80-100% scale). Instrument span value is set on each instrument with the mid range gas. The high range calibration gas (80-100% scale) is then introduced into each instrument without any calibration adjustments. Linearity is confirmed, if all values agree with the calibration gas value to within 2% of the range.

Stratification Check:

A stack stratification check is performed (pre-test only) by traversing the stack comparing four traverse points to the reference point (center). If the gas composition is homogenous, $<10\%$ variation between any traverse points in the gas stream and the reference point. Single point gas sampling is performed at the reference point. If stratification exceeds the 10% criteria, then the stack cross section is traversed during sampling.

System Bias Check:

The system bias check is accomplished by transporting the same gases used to zero and span the analyzers to the sample system as close as practical to the probe inlet. This is accomplished by opening a valve located on the probe, allowing the gas to flow to the probe and back through the moisture knockout and sample line to the analyzers. During this check the system is operated at the normal sampling rate with no adjustments. The system bias check is considered valid if the difference between the gas concentration exhibited by the measurement system which a known concentration gas is introduced at the sampling probe tip and when the sample gas is introduced directly to the analyzer, does not exceed $\pm$ 5% of the analyzer range.

Response Time:

Response time (upscale and downscale) for each analyzer is recorded during the system bias check. Upscale response time is defined as the time it takes the subject analyzer gas to reach 95% of the calibration gas value after introducing the upscale gas to the sample bias calibration system. Downscale response time is defined as the time it takes the subject analyzer to return to zero after the zero gas is introduced into the sample system bias calibration system.

NO_x Conversion Efficiency

The NO_x analyzer NO_2 conversion efficiency is determined by injecting a NO_2 gas standard directly into the NO_x analyzer (after initial calibration). The analyzer response must be a least 90% of the NO_2 standard gas value.

NO_2 Converter Efficiency (alternate method)

The mid level NO gas standard is directly injected into a clean leak-free Tedlar bag. The bag is then diluted 1:1 with air (20.9 % O_2). The bag is immediately attached to the NO_x sample line. The initial NO_x concentration is recorded on the strip chart. After at least 30 minutes the Tedlar bag is reattached to the NO_x sample line. Analyzer response must be at 98% of the initial Tedlar bag NO_x value to be acceptable.

In between each sampling run the following procedures are conducted:

Zero and Calibration Drift Check:

Upon the completion of each test run, the zero and calibration drift check is performed by introducing zero and mid range calibration gases to the instruments, with no adjustments (with the exception of flow to instruments) after each test run. The analyzer response must be within $\pm$ 3% of the actual calibration gas value.

Analyzer Calibration:

Upon completion of the drift test, the analyzer calibration is performed by introducing the zero and mid range gases to each analyzer prior to the upcoming test run and adjusting the instrument calibration as necessary.

System Bias Check

(same as above)

A schematic of the sample system and specific information of the analytical equipment is provided in the following pages.

TABLE 1

CONTINUOUS EMISSIONS MONITORING LABORATORY - TRUCK

NO_X CHEMILUMINESCENT ANALYZER -- THERMO ELECTRON MODEL 10 A

Response Time (0-90%)	1.5 sec -- NO mode/1.7 sec -- NO_x mode
Zero Drift	Negligible after 1/2 hour warmup
Linearity	± 1% of full scale
Accuracy	Derived from the NO or NO_2 calibration gas, ± 1% of full scale
Operating Ranges (ppm)	2.5, 10, 25, 100, 250, 1000, 2500, 10000
Output	0-1 volt

O_2 ANALYZER, FUEL TYPE -- TELEDYNE MODEL 326RA

Response Time (0-90%)	60 seconds
Accuracy	± 1% of scale at constant temperature ± 1% of scale of ± 5% of reading, whichever is greater, over the operation temperature range.
Operating Ranges (%)	0-5, 0-25
Output	0-1 volt

O_2 ANALYZER, PARAMAGNETIC -- SERVOMEX MODEL 1400B

Response Time (0-90%)	15 seconds
Accuracy	0.1% oxygen
Linearity	± 1% scale
Operating Ranges (%)	0-25, 0-100
Output	0-1 volt

CO GAS FILTER CORRELATION -- THERMO ELECTRON MODEL 48H

Response Time (0-95%)	1 minute
Zero Drift	± 0.2 ppm CO
Span Drift	Less than 1% full scale in 24 hours
Linearity	± 1% full scale, all ranges
Accuracy	± 0.1 ppm CO
Operating Ranges (ppm)	50, 100, 250, 500, 1000, 2500, 5000, 10,000, 25,000, 50,000
Output	0-1 volt

CO_2 INFRARED GAS ANALYZER -- HORIBA - MODEL PIR 2000

Response Time (0-90%)	5 seconds
Zero Drift	± 1% of full scale in 24 hours
Span Drift	± 1% of full scale in 24 hours
Linearity	± 2% of full scale
Resolution	Less than 1% of full scale
Operating Ranges (%)	0-5, 0-15, 0-25
Output	0-1 volt

SO_2 PULSED FLOURESCENT - TECO - MODEL 43C-HL

Response Time	80 seconds
Zero Drift	± 1%
Span Drift	± 1%
Linearity	± 1%
Resolution	± 1%
Operating Ranges	5, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000
Output	0-10 volt

RATFISCH FID TOTAL HYDROCARBON ANALYZER -- MODEL 55CA

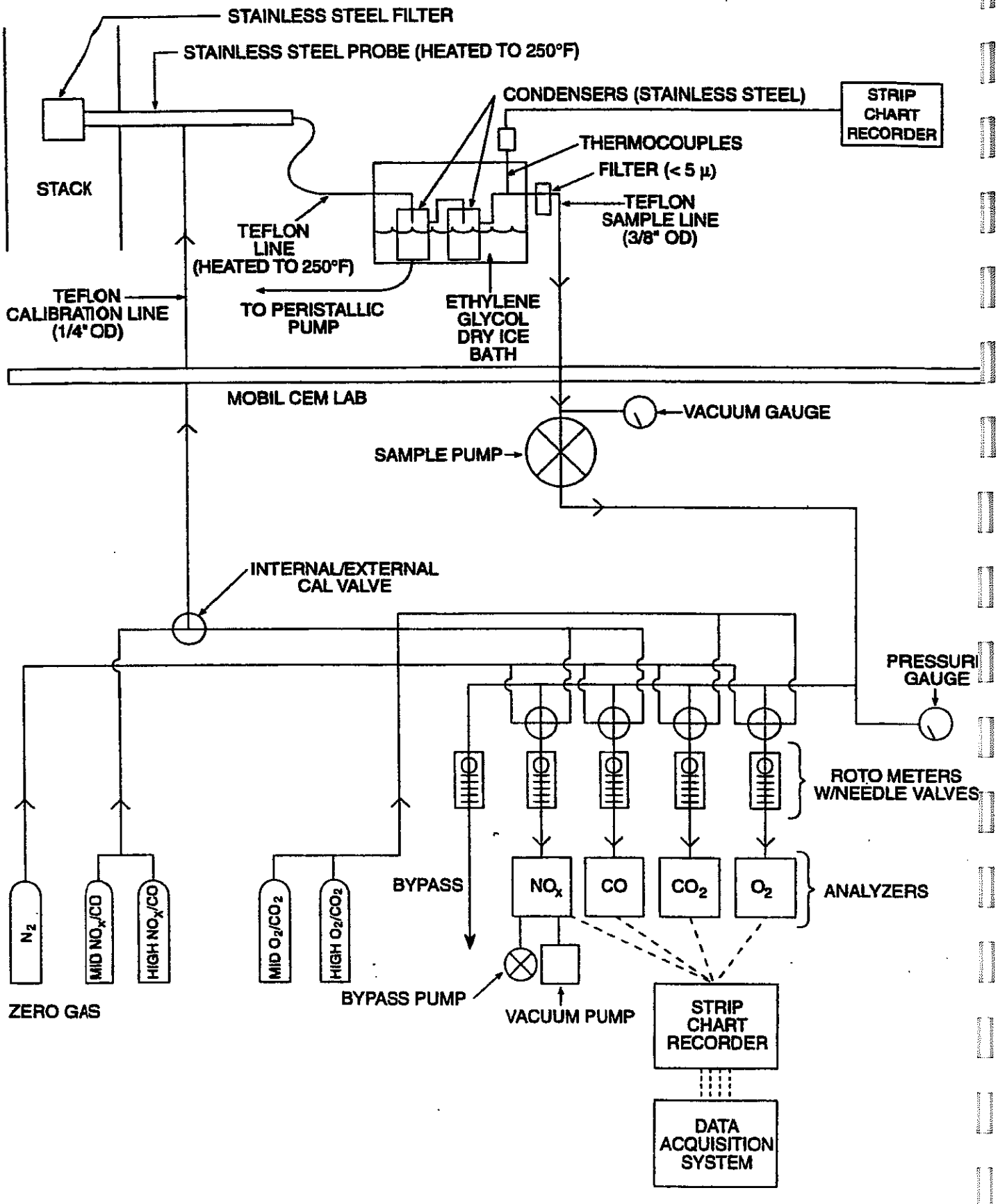
Response Time (0-90%)	5 seconds
Zero Drift	± 1% full scale in 24 hours
Span Drift	± 1% full scale in 24 hours
Linearity	± 1% full scale - constant
Accuracy	± 1% full scale at constant temp.
Operating Ranges (ppm)	10, 100, 1000, 10,000
Output	0 - 10 volts

LINSEIS MODEL L2045 FOUR PEN STRIP CHART RECORDER

Pen Speed	up to 120 cm/min
Measuring Response	0-20 volts
Linearity Error	0.25%
Accuracy	0.3%
Zero Suppression	Manual (from 1 to 10X full scale)

LINEAR 3 PEN CONTINUOUS -- MODEL 595 STRIP CHART

Pen Response	20 inches/second
Measuring Response	1 Mv through 5V
Zero Set	Electronically adjustable full scale with 1 full scale of zero suppression
Accuracy	Total limit of error ± 0.5%



CEM System Schematic

Method:	**NO/NO_X by Continuous Analyzer**
Applicable Reference Methods:	EPA 7E, EPA 20; CARB 100, BAAQMD ST-13A, SCAQMD 100.1
Principle:	A sample is continuously withdrawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of NO or NO_X.
Analyzer:	TECO Model 10AR
Measurement Principle:	Chemiluminescence
Accuracy:	1% of full scale
Ranges:	0-2.5, 0-10, 0-25, 0-100, 0-250, 0-1000, 0-2500, 0-10,000 ppm
Output:	0-10 V
Inferences:	Compounds containing nitrogen (other than ammonia) may cause interference.
Response Time:	90%, 1.5 seconds (NO mode) and 1.7 seconds (NO_X mode)
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. If EPA Method 20 is used, that method's specific procedures for selecting sample points are used.
Analytical Procedure:	The oxides of nitrogen monitoring instrument is a chemiluminescent nitric oxide analyzer. the operational basis of the instrument is the chemiluminescent reaction of NO and ozone (O_3) to form NO_2 in an excited state. Light emission results chemiluminescence is monitored through an optical filter by a high sensitivity photomultiplier tube, the output of which is electronically processed so it is linearly proportional to the NO concentration. The output of the instrument is in ppmV. When NO_2 is expected to be present in the flue gas, a supercooled water dropout flask will be placed in the sample line to avoid loss of NO_2. Since NO_2 is highly soluble in water, "freezing out" the water will allow the NO_2 to reach the analyzers for analysis. The analyzer measures NO only. In the NO_X mode, the gas is passed through a moly converter which converts NO_2 to NO and a total NO_X measurement is obtained. NO_2 is determined as the difference between NO and NO_X. Use of a moly converter instead of a stainless steel converter eliminates NH_3 interference; NH_3 is converted to NO with a stainless converter, but not with a moly converter.

Method:	**Oxygen (O_2) by Continuous Analyzer**
Applicable Reference Methods:	EPA 3A, EPA 20, CARB 100, BAAQMD ST-14, SCAQMD 100.1
Principle:	A sample is continuously withdrawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of O_2 concentration.
Analyzer:	Teledyne Model 326R
Measurement Principle:	Electrochemical cell
Ranges:	0-5, 0-25% 0-100%
Accuracy:	1% of full scale
Output:	0-1 V
Interferences:	Halogens and halogenated compounds will cause a positive interference. Acid gases will consume the fuel cell and cause a slow calibration drift.
Response Time:	90% <60 seconds
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. If Method 20 is used, that method's specific procedures for selecting sample points are used. Otherwise, stratification checks are performed at the start of a test program to select single or multiple-point sample locations.
Analytical Procedure:	An electrochemical cell is used to measure O_2 concentration. Oxygen in the flue gas diffuses through a Teflon membrane and is reduced on the surface of the cathode. A corresponding oxidation occurs at the anode internally and an electric current is produced that is proportional to the concentration of oxygen. This current is measured and conditioned by the instrument's electronic circuitry to give an output in percent O_2 by volume.

Method:	**Carbon Dioxide (CO_2) by Continuous Analyzer**
Applicable Reference	EPA 3A, CARB 100, BAAQMD ST-5, SCAQMD 100.1
Principle:	A sample is continuously drawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of CO_2 concentration.
Analyzer:	PIR 2000
Measurement Principle:	Non-dispersive infrared (NDIR)
Accuracy:	1% of full scale
Ranges:	0-5, 0-15%
Output:	0-1 V
Interferences:	A possible interference includes water. Since the instrument receives dried sample gas, this interference is not significant.
Response Time:	5 seconds
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously.
Analytical Procedure:	Carbon dioxide concentrations are measured by short path length non-dispersive infrared analyzers. These instruments measure the differential in infrared energy absorbed from energy beams passed through a reference cell (containing a gas selected to have minimal absorption of infrared energy in the wavelength absorbed by the gas component of interest) and a sample cell through which the sample gas flows continuously. The differential absorption appears as a reading on a scale of 0-100%.

Method:	**Carbon Monoxide (CO) by NDIR/Gas Filter Correlation**
Applicable Reference Methods:	EPA 6C; CARB 1-100; BAAQMD ST-6, SCAQMD 100.1
Principle:	A sample is continuously drawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of CO concentration.
Analyzer:	TECO, Model 48H
Measurement Principle:	NDIR/Gas Filter Correlation
Precision:	0.1% ppm
Ranges: ppm	0-50, 0-100, 0-250, 0-500, 0-1000, 0-2500, 0-5000, 0-10000, 0-2500, 0-3,000
Output:	0-1 V
Interferences:	Negligible interference from water and CO_2
Rise/Fall times (0-95%)	1 minute @ 1 lpm flow, 30 second integration time
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. Sample point selection has been described previously.
Analytical Procedure:	Radiation from an infrared source is chopped and then passed through a gas filter which alternates between CO and N_2 due to rotation of a filter wheel. The radiation then passes through a narrow band-pass filter and a multiple optical pass sample cell where absorption by the sample gas occurs. The IR radiation exits the sample cell and falls on a solid state IR detector.

Method:	**Sulfur Dioxide (SO_2) by Pulsed Flourescent**
Applicable Reference Methods:	EPA 10; CARB 1-100; BAAQMD ST-6, SCAQMD 100.1
Principle:	A sample is continuously drawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of SO_2 concentration.
Analyzer:	TECO, Model 43C-HL
Measurement Principle:	Pulsed flourescense SO_2 analyzer
Precision:	0.1% ppm
Ranges:	5, 10, 20, 50, 100, 200 ppm
Output:	0-10 V
Interferences:	Less than lower detectable limit except for the following: NO <3 ppb, m-xylene <2 ppm, H_2O <2% of reading.
Response Time:	80 seconds
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. Sample point selection has been described previously.
Analytical Procedure:	The sample flows into the flourescent chamber, where pulsating UV light excites the SO_2 molecules. The condensing lens focuses the pulsating UV light into the mirror assembly. The mirror assembly contains four selecting mirrors that reflect only the wavelengths which excite SO_2 molecules. As excited SO_2 molecules decay to lower energy states they emit UV light that is proportional to the SO_2 concentration. The PMT (photomultiplier tube) detects UV light emission from decaying SO_2 molecules. The PMT continuously monitors pulsating UV light source and is connected to a circuit that compensates for fluctuating in the light.

AtmAA Inc.
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environmental consultants
laboratory services

Tandem Gas Chromatographic/Mass Spectroscopic-Electrolytic Conductivity Detector (GC/MS-ELCD) Method for Determination of Total Sulfur in Gas Samples

AtmAA, Inc.
03-060

3/30/93

This method measures selected reduced sulfur species, including but not limited to hydrogen sulfide, carbonyl sulfide, methyl mercaptan, ethyl mercaptan, dimethyl sulfide, carbon disulfide, isopropyl mercaptan, n-propyl mercaptan, and dimethyl disulfide in gaseous sample matrices using gas chromatographic separation and a mass spectrometric and electrolytic conductivity detector (ELCD), where the ELCD measures hydrogen sulfide only. A non-polar methyl silicon capillary gas chromatographic column is used for component separation and selected ion monitoring is used for component quantification. Component quantification is obtained using a multi-component external standard prepared by Scott Specialty Gases. The lower detection limit varies by component but is at least 0.1 ppmv ethyl mercaptan (component of lowest sensitivity) for a 0.31 ml sample volume injection. The upper quantitation limit has not been determined but is at least beyond 80 ppmv dimethyl disulfide, for which response remained linear from 0.1 ppmv to 80 ppmv.

Hydrogen sulfide is measured using an electrolytic conductivity detector operated in the oxidative sulfur mode. A Chromosil 310 column, operated isothermally at 45°C. is used to separate H_2S from other sulfur components. A fixed volume loop injection is used in the analysis for H_2S.

Lower Detection Limits (LDL's):

Using a 1 ml injection volume for H_2S by electrolytic conductivity detector and 0.40 ml injection volume for GC/MS measured sulfur compounds, the following LDL's are obtained:

	(ppmv)
Hydrogen sulfide	0.5
Carbonyl sulfide	0.03
Methyl mercaptan	0.03
Ethyl mercaptan	0.04
Dimethyl sulfide	0.02
Carbon disulfide	0.02
i-propyl mercaptan	0.03
n-propyl mercaptan	0.03
Dimethyl disulfide	0.02

Equipment:

A Hewlett-Packard 5890 series II gas chromatograph (GC), Hewlett-Packard 5971A Mass Selective Detector, 486 MS/DOS computer and HP operating software are used for all sulfur species except H_2S. The GC is fitted with a heated 6-port Valco 1/16" line, sample injection valve. All gas transfer lines to the sample loop are fused silica lined Restek tubing. The fixed volume (0.40 ml) sample loop is Teflon. The transfer line from the valve to the GC column is cleaned and treated blank 0.53 mm OD fused silica line with polyimide coating.

H_2S is measured using a Varian 1400 GC with the Hall oxidative quartz tube furnace and electrolytic cell attached. Nitrogen is used as carrier and oxygen is used as the combustion gas.

Multi-component gaseous standards are prepared by Scott Specialty Gas and are contained in two separate aluminum cylinders and a Scotty IV canister as follows:

Cylinder A (CAL12250)		Cylinder B (CAL3563)	
Carbonyl sulfide	15.2 ppmv	Hydrogen sulfide	12.3 ppmv
Ethyl mercaptan	13.4 ppmv	Methyl mercaptan	22.6 ppmv
Carbon disulfide	16.1 ppmv	Dimethyl sulfide	20.3 ppmv
		Dimethyl disulfide	

Scotty IV (mix 252)

Hydrogen Sulfide 93.8 ppmv

Gas tight clean glass volumetric syringes of 10, 20, & 50 ml capacity, with smooth glass barrel (not sintered glass) are used to make volumetric dilutions of sample or standard.

GC/MS SIM parameters:

	Dwell per ion	start time	Ions
Group 1:	75 msec.	8.0 min.	60
Group 2:	75 msec.	10.0 min.	47,48,64
Group 3:	75 msec.	14.5 min.	47,62,76,78,43,61
Group 4:	75 msec.	19.5 min.	79,94,122,142,156, 128

Components monitored:

Group 1: carbonyl sulfide
Group 2: methyl mercaptan
Group 3: ethyl mercaptan, dimethyl ~~di~~sulfide, carbon disulfide, isopropyl mercaptan, n-propyl mercaptan
Group 4: dimethyl sulfide

Component	Quantitation ion	Confirmation ion
carbonyl sulfide	60	none
methyl mercaptan	47	48
ethyl mercaptan	62	47
dimethyl sulfide	62	47
carbon disulfide	76	78
iso-propyl mercaptan	76	43,47,61
n-propyl mercaptan	76	43,47,61
dimethyl disulfide	94	79

Sulfur dioxide is analyzed by monitoring mass 64 which is included in Group 2 ions.

Calibration:

Gaseous standards can be analyzed prior to or after a set of samples. Response factors are determined from a single point standard calibration. Multi-point calibrations are performed to verify linearity. Consistency of standard response with continuing calibrations is observed to indicate performance of multi-point calibration.

Samples containing components at less than the stated LDL can be analyzed by cryogenically focusing a measured volume of gaseous sample onto a glass bead filled Teflon loop immersed in liquid argon. The sample is thermally transferred upon injection by immersing the sample loop in near boiling temperature water. The LDL obtained by this technique is calculated as:

$$LDL_{cryo} = (\text{cryo volume}/0.40) * LDL_{0.40}$$

Acceptable volumes for cryogenic concentration range from 3 to 10 ml. and are determined based on amounts of other components in the sample such as water, carbon dioxide or hydrocarbons.

Procedure:

A volumetric sample of landfill or source collected gas is transferred from a Tedlar® bag to the 6-port valve injection line using a glass syringe of approximately 10 ml. A Teflon loop of 0.40 ml volume is used to inject the sample. When sample concentrations exceed that of the standard, appropriate volumetric sample dilutions are made using the glass syringes with dry nitrogen diluent. Immediately after sample injection, the GC/MS is started. Standards are analyzed in the same manner as samples. Appropriate component peaks are monitored and integrated after sample analysis data set has been obtained.

Hydrogen sulfide is measured using the electrolytic conductivity detector by a separate direct fixed loop valve injection using heated Teflon loop, transfer lines, and Teflon Chromosil 310 GC column.

A response factor for a standard component is calculated as:

rf = std. amt. / std. area

Sample concentration is calculated using the response factor:

conc. = rf x sample area

At least 10% of samples in a sample set, or minimum of one sample per set are analyzed twice to determine precision. A separate report showing repeat analyses results is included with an analytical report of sulfur component concentrations per each sample set. Repeat analyses must agree within +/- 10% except for component concentrations less than 1 ppmv. A nitrogen blank is analyzed between standards and samples to verify that there is no component carry-over. Samples are analyzed as soon after they are ived as possible, preferably same day and within four hours of ection. Data is being gathered to determine stability of sulfur compounds in Tedlar® bag containers in an effort to extend sample holding time. Samples are usually analyzed before standards to prevent carry-over, since most sulfur components measured in landfill gas samples are lower in concentration than those in the standards.

GC/MS Analysis Conditions:

GC conditions: a 30 M x 0.2 mm, 0.50 um film methyl silicon PONA column from Hewlett-Packard is temperature programmed as follows:

-65 degrees C, hold min.
15 degrees C min. to 220 degrees C, hold 5 min.

Valve oven Temp. 150 degrees C
GC/MS transfer line 180 degrees C
Carrier gas is helium, pressure regulated at 21 psi.

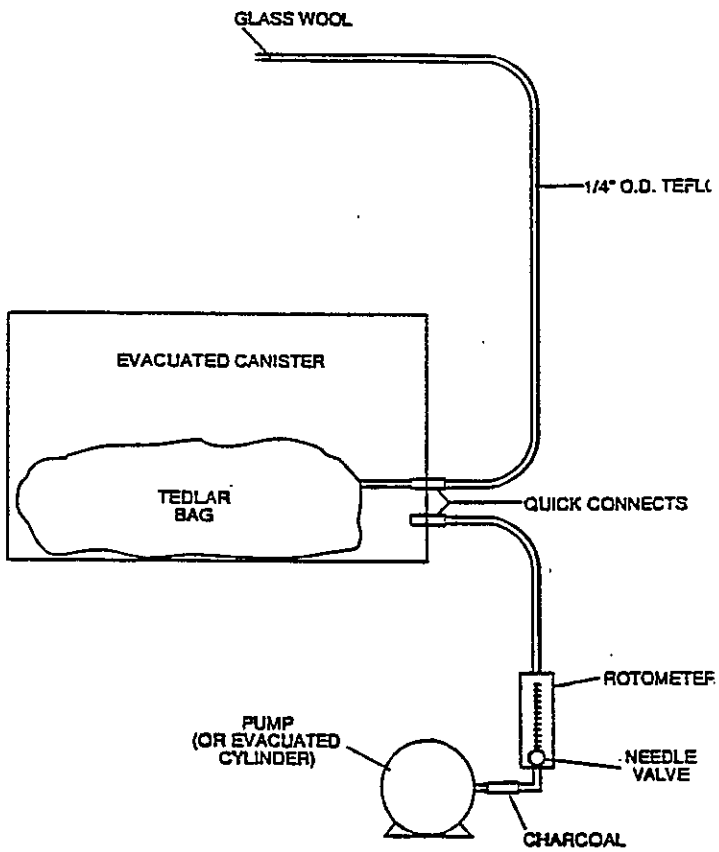
MS Conditions:

MS calibration is performed periodically prior to performing analyses using PFTBA (perfluoro-tributylamine) as supplied by Hewlett-Packard and as controlled by HP software under the mid-range auto tine program.
Solvent delay = 8 min.

Hall Detector/GC Analysis Conditions:

6' x 1/8" Teflon, Chromosil 310 analytical column
45 degrees C, isothermal
Valve oven & transfer line Temp. 105 degrees C.
Carrier gas is nitrogen, flow rate 18 cc/min.
Oxygen oxidation gas, flow rate 18 cc/min.
Quartz tube oxidation oven Temp. 650 degrees C.

Method:	**Hydrocarbons by SCAQMD Micro Total Carbon Analyses**
Reference:	Tedlar Bag Lung Sampler
Principle:	Duplicate Tedlar bags are filled with flue gas at a constant rate. The bag contents are analyzed by total combustion analyses/flame ionization detection for methane and total gaseous non-methane hydrocarbons.
Sampling Procedure:	Duplicate samples are collected by evacuating the canister (see figure) at a constant rate over each test run using a rotameter/needle valve and a diaphragm pump. Prior to each sampling run, the evacuated canister (containing the Tedlar bag) is leak checked at 2" Hg vacuum. The sample train upstream of the Tedlar bag is then purged with stack gas. At the conclusion of each test run, each Tedlar bag sample is sealed and stored in an opaque container pending analysis.
Analytical Procedure:	Methane and TNMHC concentration from both samples are determined using the SCAQMD Total Combustion Analysis (TCA) procedure.



APPENDIX B - Computer Printout of Results

Facility: Bradley Landfill
Source: Flare #1
Job No.: W07-035
Date: 04/23/03

TOTAL COMBUSTION ANALYSIS RESULTS

Sample ID	Inlet	Inlet	
Run Number	1A	1B	Average
Methane in Tank	391000	390000	390500
TNMHC,Tank (Noncond.)	856	838	
TNMHC - Condensables	8917.1	9763.3	
TNMHC - Total	9773.1	10601.3	
CO Concentration (ppm)	52.3	54.5	53.4
CO2 Concentration (ppm)	337000	333000	335000
O2 Concentration (%)	2.69	2.95	2.82
Sample Parameters			
Tank Number	A	D	
Trap Number	R	O	
Sample Tank Volume (l)	12.202	12.051	
Initial Pressure (Torr)	2.5	2.5	
Initial Temperature (deg. K)	292	292	
Final Pressure (mm Hg)	455	437	
Final Temperature (deg. K)	292	292	
Sample Volume (l)	7.29	6.92	
Analysis Pressure (mm Hg)	800	800	
Analysis Temperature (deg. K	292	292	
ICV Volume (l)	2.266	2.266	
ICV Final Pressure (mm Hg)	800	800	
ICV Final Temperature (deg.	292	292	
CO2 in ICV (ppm)	28700	29800	
TNMHC,Trap (Condensables)	8917	9763	
Stack Total TNMHC	9773	10601	10187

NOTE: All hydrocarbon values are in terms of ppm, v/v, as methane.

Facility: Bradley Landfill
Source: Flare #1
Job No.: W07-035
Date: 04/23/03

STANDARD TEMPERATURE	Degrees F	60		
RUN NUMBER	******	1	2	Average
CLOCK TIME: INITIAL	******	1012	1153	
CLOCK TIME: FINAL	******	1112	1253	
AVG. STACK TEMPERATURE	Degrees F	141	143	142
AVG. SQUARE DELTA P	Inches H20	1.0559	1.0593	1.0576
BAROMETRIC PRESSURE	Inches HG	29.17	29.17	29.17
SAMPLING TIME	Minutes	60	60	60
SAMPLE VOLUME	Cubic Feet	46.845	46.815	46.830
AVG. METER TEMP.	Degrees F	78.8	86.4	82.6
AVG. DELTA H	Inches H20	1.70	1.70	1.70
DGM CALIB. FACTOR [Y]	******	0.9873	0.9873	0.9873
WATER COLLECTED	Milliliters	52	65	59
CO 2	Percent	33.5	33.5	33.5
O 2	Percent	2.8	2.8	2.8
CO	Percent	0.0	0.0	0.0
CH4	Percent	39.1	39.1	39.1
N 2	Percent	24.6	24.6	24.6
STACK AREA	Square Inches	137.9	137.9	137.9
STATIC PRESSURE	Inches WG	10.00	10.00	10.00
PITOT COEFFICIENT	******	0.99	0.99	0.99
SAMPLE VOLUME DRY	DSCF	43.70	43.07	43.39
WATER AT STD.	SCF	2.5	3.1	2.8
MOISTURE	Percent	5.3	6.6	6.0
MOLE FRACTION DRY GAS	******	0.95	0.93	0.94
MOLECULAR WT.DRY	lb/lb Mole	28.79	28.79	28.79
EXCESS AIR	Percent	77	77	77
MOLECULAR WT. WET	lb/lb Mole	28.21	28.07	28.14
STACK GAS PRESSURE	Inches HG	29.91	29.91	29.91
STACK VELOCITY	AFPM	4526	4560	4543
VOLUMETRIC FLOWRATE, DRY STD	DSCFM	3549	3514	3531
VOLUMETRIC FLOWRATE, ACTUAL	ACFM	4334	4367	4350
EMISSION RATES				
SAMPLE A				
TNMHC Concentration, as CH4	ppm	9773		9773
TNMHC Concentration, as CH4	mg/dscf	187		187
TNMHC Emission Rate, as CH4	lb/hr	87.7		87.2
SAMPLE B				
TNMHC Concentration, as CH4	ppm	10601		10601
TNMHC Concentration, as CH4	mg/dscf	203		203
TNMHC Emission Rate, as CH4	lb/hr	95.1		94.6
AVERAGE				
TNMHC Concentration, as CH4	ppm	10187		10187
TNMHC Concentration, as CH4	mg/dscf	195		195
TNMHC Emission Rate, as CH4	lb/hr	91.4		90.9

SCAQMD Method 307.91

Facility: Bradley Landfill
Source: Flare #1
Job No.: W07-035
Date: 04/23/03

Sulfur Compounds

Speciated Compound		Concentration ppm, as H2S	No. of S molecules in Compound	Total S ppm, as H2S	SO2 Conc. mg/dscf	Avg. Inlet Flow Rate dscfm	SO2 Rate lb/hr
Hydrogen Sulfide		48.4	1	48.40	3.706	3531	1.731
Carbonyl Sulfide		0.42	1	0.42	0.032	3531	0.015
Methyl mercaptan		3.16	1	3.16	0.242	3531	0.113
Ethyl mercaptan	<	0.09	1	0.09	0.007	3531	0.003
Dimethyl sulfide		9.50	1	9.50	0.727	3531	0.340
Carbon disulfide		0.22	2	0.44	0.034	3531	0.016
Dimethyl disulfide		0.220	2	0.44	0.034	3531	0.016
iso-propyl mercaptan		0.28	1	0.28	0.021	3531	0.010
n-propyl mercaptan	<	0.06	1	0.06	0.005	3531	0.002
Total				62.79			2.246

EXPANSION AND F-FACTOR CALC. METHOD

Client:	Bradley Landfill	Date:	04/23/03
Location:	Sun Valley, CA	Job #:	W07-035
Unit:	Flare #1	Run#:	1

Fuel temperature		deg. F	Std. Temp.	60	deg. F
Fuel Pressure		psi			
Fuel Flow Rate		cfm	Fuel Flow	3549	dscfm
Exhaust Outlet O2	13.78	%			
Barometric Pressure	29.17				

COMPONENTS		MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen		2.82			0.028
Nitrogen		24.62			0.246
Carbon Dioxide		33.50			0.335
Methane		39.05	394.41	355.12	3.347
Ethane	C2		0.00	0.00	0.000
Propane	C3		0.00	0.00	0.000
Iso-Butane	C4		0.00	0.00	0.000
N-Butane			0.00	0.00	0.000
Iso-Pentane	C5		0.00	0.00	0.000
N-Pentane			0.00	0.00	0.000
Hexane	C6		0.00	0.00	0.000
Heptane	C7		0.00	0.00	0.000
Octane	C8		0.00	0.00	0.000
Nonane	C9		0.00	0.00	
Total		**99.99**	**394.41**	**355.12**	**3.96**

CALCULATIONS

EXHAUST FLOW RATE, Q = (scfm*Exp Fac)*(20.92(20.92-%O2)

41134 DSCFM

EPA F-Factor = (scf exhaust/scf fuel)/(btu/scf fuel)*(1000000 btu/MMbtu)

10030 dscf/Mmbtu

EXPANSION AND F-FACTOR CALC. METHOD

Client:	Bradley Landfill	Date:	04/23/03
Location:	Sun Valley, CA	Job #:	W07-035
Unit:	Flare #1	Run#:	2

Fuel temperature		deg. F	Std. Temp.	60 deg. F
Fuel Pressure		psi		
Fuel Flow Rate		cfm	Fuel Flow	3514 dscfm
Exhaust Outlet O2	14.24	%		
Barometric Pressure	29.17			

COMPONENTS		MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen		2.82			0.028
Nitrogen		24.62			0.246
Carbon Dioxide		33.50			0.335
Methane		39.05	394.41	355.12	3.347
Ethane	C2		0.00	0.00	0.000
Propane	C3		0.00	0.00	0.000
Iso-Butane	C4		0.00	0.00	0.000
N-Butane			0.00	0.00	0.000
Iso-Pentane	C5		0.00	0.00	0.000
N-Pentane			0.00	0.00	0.000
Hexane	C6		0.00	0.00	0.000
Heptane	C7		0.00	0.00	0.000
Octane	C8		0.00	0.00	0.000
Nonane	C9		0.00	0.00	
Total		**99.99**	**394.41**	**355.12**	**3.96**

CALCULATIONS

EXHAUST FLOW RATE, Q = (scfm*Exp Fac)*(20.92(20.92-%O2)

43527 DSCFM

EPA F-Factor = (scf exhaust/scf fuel)/(btu/scf fuel)*(1000000 btu/MMbtu)

10030 dscf/Mmbtu

SCAQMD Method 5.1 Particulate Emissions

Facility: Bradley Landfill
Source: Flare #1
Job No.: W07-035
Date: 04/23/03

STANDARD TEMPERATURE	Degrees F	60					
RUN NUMBER	******	1	2	1		2	
DATE OF RUN	******	04/23/03	04/23/03	04/23/03		04/23/03	
CLOCK TIME: INITIAL	******	1012	1153	1012		1153	
CLOCK TIME: FINAL	******	1122	1302	1122		1302	
AVG. STACK TEMPERATURE	Degrees F	1526	1523				
AVG. SQUARE DELTA P	Inches H20	0.1414	0.1414				
NOZZLE DIAMETER	Inches	0.976	0.976				
BAROMETRIC PRESSURE	Inches HG	29.17	29.17				
SAMPLING TIME	Minutes	60	60				
SAMPLE VOLUME	Cubic Feet	68.030	65.869				
AVG. METER TEMP.	Degrees F	73.9	69.9				
AVG. DELTA H	Inches H20	4.00	4.00				
DGM CALIB. FACTOR [Y]	******	0.9876	0.9876				
WATER COLLECTED	Milliliters	138	141				
CO 2	Percent	6.46	6.08				
O 2	Percent	13.78	14.24				
CO	Percent						
CH4	Percent						
N 2	Percent	79.76	79.68				
STACK AREA	Square Inches	16286.0	16286.0				
STATIC PRESSURE	Inches WG.	-0.005	-0.005				
PITOT COEFFICIENT	******	0.84	0.84				
SAMPLE VOLUME DRY	DSCF	64.44	62.86				
WATER AT STD.	SCF	6.5	6.6				
MOISTURE	Percent	9.2	9.6				
MOLE FRACTION DRY GAS	******	0.91	0.90				
MOLECULAR WT.DRY	lb/lb Mole	29.59	29.54				
EXCESS AIR	Percent	189	210				
MOLECULAR WT. WET	lb/lb Mole	28.52	28.44				
STACK GAS PRESSURE	Inches HG	29.17	29.17				
STACK VELOCITY	AFPM	941	942				
VOLUMETRIC FLOWRATE, DRY STI	DSCFM	24687	24633	41134	*	43527	*
VOLUMETRIC FLOWRATE, ACTUAL	ACFM	106465	106549				
ISOKINETIC RATIO	Percent	93	91				

CALCULATIONS FOR GRAIN LOADING AND EMISSION RATES

TOTAL PARTICULATE	mg	6.1	5.9	6.1	5.9
PARTICULATE CONCENTRATION	gr/dscf	0.0015	0.0014	0.0015	0.0014
PARTICULATE EMISSION RATE	lb/hr	0.31	0.31	0.51	0.54

*Denotes the use of calculated flowrate based on expansion factor of LFG.

SCAQMD Method 100.1 Emission Rates

Facility: Bradley Landfill
Source: Flare #1
Job No.: W07-035
Date: 04/23/03

Run Number	******		1		2
Load	******		as Found		as Found
EPA F-Factor	dscf/MMBtu		10030		10030
Stack Flow Rate	dscfm		41134		43527
Oxygen	%		13.78		14.24
Carbon Dioxide	%		6.46		6.08
Oxides of Nitrogen					
Concentration	ppm		8.5		7.7
Concentration @ 3 % O2	ppm		21.3		20.6
Concentration	lb/dscf		1.03E-06		9.29E-07
Emission Rate	lb/MMBtu		3.02E-02		2.92E-02
Emission Rate	lb/hr		2.532		2.427
Carbon Monoxide					
Concentration	ppm	<	20.0	<	20.0
Concentration @ 3 % O2	ppm	<	50.3	<	53.7
Concentration	lb/dscf	<	1.48E-06	<	1.48E-06
Emission Rate	lb/MMBtu	<	4.34E-02	<	4.64E-02
Emission Rate	lb/hr	<	3.642	<	3.853

Facility: **Bradley Landfill**
Source: **Flare #1**
Job No.: **W07-035**
Date: **04/23/03**

Run No. 1

Parameter	Measured Conc. (ppm,%)	Reference Span gas (ppm.%)	Initial Bias Zero (ppm.%)	Final Bias Zero (ppm.%)	Average Bias Zero (ppm.%)	Initial Bias Span (ppm.%)	Final Bias Span (ppm.%)	Average Bias Span (ppm.%)	Bias Adjusted Conc. (ppm.%)
NOx	8.30	10.40	0.05	0.15	0.10	10.25	10.10	10.18	8.46
O2	13.68	12.01	0.03	0.00	0.01	12.00	11.85	11.93	13.78
CO	10.44	50.40	0.00	0.00	0.00	50.00	49.00	49.50	10.63
CO2	6.38	7.00	0.00	0.02	0.01	6.92	6.90	6.91	6.46

Run No. 2

Parameter	Measured Conc. (ppm,%)	Reference Span gas (ppm.%)	Initial Bias Zero (ppm.%)	Final Bias Zero (ppm.%)	Average Bias Zero (ppm.%)	Initial Bias Span (ppm.%)	Final Bias Span (ppm.%)	Average Bias Span (ppm.%)	Bias Adjusted Conc. (ppm.%)
NOx	7.54	10.40	0.15	0.15	0.15	10.10	10.25	10.18	7.67
O2	14.07	12.01	0.00	0.10	0.05	11.85	11.90	11.88	14.24
CO	8.76	50.40	0.00	0.00	0.00	49.00	49.80	49.40	8.94
CO2	6.05	7.00	0.02	0.02	0.02	6.90	7.02	6.96	6.08

Client:	Waste Management	Date:	04/23/02
Job No.:	W07-035	Run #:	1
Site:	Bradley Landfill	Fuel:	L.F.G.
Unit:	Flare #1	Std. O2:	3

	O2 %	CO2 %	NOx ppm	CO ppm
Range:	25.00	20.00	25.00	100.00
Span:	12.01	7.00	10.40	50.40
Low:				
High:	20.90	12.01	21.00	79.20

** POST-TEST DRIFT **

Values				
Zero:	0.00	0.00	0.00	0.00
Span:	11.80	7.04	10.55	50.00
Percent Drift				
Zero:	0.00	0.00	0.00	0.00
Span:	-0.84	0.20	0.60	-0.40

** RAW AVERAGE CONCENTRATION **

Average:		13.68	6.38	8.30	10.44
O2 adjust:	3.0			20.59	25.88
Date	Time	O2	CO2	NOx	CO
21-Apr-03	1012	13.61	6.44	8.43	0.52
21-Apr-03	1013	13.54	6.49	8.39	0.27
21-Apr-03	1014	13.69	6.36	8.08	8.06
21-Apr-03	1015	13.75	6.29	8.01	19.78
21-Apr-03	1016	13.60	6.45	7.97	35.04
21-Apr-03	1017	13.45	6.60	8.17	15.23
21-Apr-03	1018	13.37	6.68	8.61	1.01
21-Apr-03	1019	13.49	6.56	8.45	1.20
21-Apr-03	1020	13.68	6.37	8.32	1.78
21-Apr-03	1021	13.72	6.32	8.20	7.25
21-Apr-03	1022	13.68	6.38	7.97	29.73
21-Apr-03	1023	13.61	6.44	8.17	6.56
21-Apr-03	1024	13.69	6.36	8.31	1.52
21-Apr-03	1025	13.75	6.31	8.00	16.18
21-Apr-03	1026	13.69	6.36	7.98	6.40
21-Apr-03	1027	13.65	6.40	7.99	10.37
21-Apr-03	1028	13.50	6.55	8.29	3.22
21-Apr-03	1029	13.62	6.42	8.28	4.37
21-Apr-03	1030	13.94	6.09	7.51	75.95
21-Apr-03	1031	13.70	6.34	7.38	90.98
21-Apr-03	1032	13.53	6.52	8.23	6.62
21-Apr-03	1033	13.65	6.41	8.19	4.09
21-Apr-03	1034	13.69	6.36	8.29	18.56

21-Apr-03	1035	13.79	6.27	8.10	16.65
21-Apr-03	1036	13.71	6.35	8.03	10.80
21-Apr-03	1037	13.44	6.63	8.50	4.22
21-Apr-03	1038	13.45	6.60	8.82	0.00
21-Apr-03	1039	13.61	6.43	8.71	0.95
21-Apr-03	1040	13.56	6.49	8.53	3.30
21-Apr-03	1041	13.62	6.42	8.41	2.55
21-Apr-03	1042	13.64	6.42	8.24	22.68
21-Apr-03	1052	13.71	6.32	8.63	0.49
21-Apr-03	1053	13.79	6.26	8.37	3.22
21-Apr-03	1054	13.91	6.14	8.10	3.20
21-Apr-03	1055	13.91	6.14	8.05	7.22
21-Apr-03	1056	13.82	6.22	8.07	4.52
21-Apr-03	1057	13.62	6.43	8.33	2.44
21-Apr-03	1058	13.78	6.28	8.38	2.45
21-Apr-03	1059	13.77	6.30	8.21	11.42
21-Apr-03	1100	13.59	6.49	8.33	7.27
21-Apr-03	1101	13.68	6.40	8.54	0.64
21-Apr-03	1102	13.70	6.39	8.60	0.27
21-Apr-03	1103	13.79	6.32	8.30	3.04
21-Apr-03	1104	13.74	6.35	8.38	1.92
21-Apr-03	1105	13.89	6.21	8.29	15.19
21-Apr-03	1106	13.63	6.46	8.36	4.14
21-Apr-03	1107	13.61	6.49	8.65	0.38
21-Apr-03	1108	13.73	6.35	8.94	0.17
21-Apr-03	1109	13.85	6.24	8.23	8.99
21-Apr-03	1110	13.91	6.17	8.23	28.53
21-Apr-03	1111	13.87	6.22	8.23	14.56
21-Apr-03	1112	13.98	6.11	7.88	44.58
21-Apr-03	1113	13.60	6.49	8.07	24.21
21-Apr-03	1114	13.60	6.47	8.78	0.01
21-Apr-03	1115	13.43	6.63	8.92	0.00
21-Apr-03	1116	13.57	6.49	8.98	0.00
21-Apr-03	1117	13.79	6.27	8.56	2.60
21-Apr-03	1118	13.74	6.31	8.28	6.41
21-Apr-03	1119	13.75	6.29	8.19	14.21
21-Apr-03	1120	13.78	6.26	8.24	6.98
21-Apr-03	1121	13.54	6.48	8.60	1.89
21-Apr-03	1122	13.63	6.39	8.61	0.33

Client:	Waste Management	Date:	04/23/02
Job No.:	W07-035	Run #:	2
Site:	Bradley Landfill	Fuel:	L.F.G.
Unit:	Flare #1	Std. O2:	3

	O2 %	CO2 %	NOx ppm	CO ppm
Range:	25.00	20.00	25.00	100.00
Span:	12.01	7.00	10.40	50.40
Low:				
High:	20.90	12.01	21.00	79.20

** POST-TEST DRIFT **

Values				
Zero:	0.00	0.00	0.00	0.00
Span:	12.00	7.04	10.45	50.00
Percent Drift				
Zero:	0.00	0.00	0.00	0.00
Span:	-0.04	0.20	0.20	-0.40

** RAW AVERAGE CONCENTRATION **

Average:		14.07	6.05	7.54	8.76
O2 adjust:	3.0			19.75	22.95
Date	Time	O2	CO2	NOx	CO
21-Apr-03	1153	14.22	5.83	7.29	38.10
21-Apr-03	1154	13.64	6.46	7.77	22.37
21-Apr-03	1155	13.66	6.46	8.46	0.00
21-Apr-03	1156	13.94	6.18	8.37	0.00
21-Apr-03	1157	14.18	5.96	7.75	0.51
21-Apr-03	1158	14.26	5.87	7.53	1.07
21-Apr-03	1159	14.29	5.86	7.37	4.65
21-Apr-03	1200	14.44	5.69	7.30	5.06
21-Apr-03	1201	14.41	5.73	6.97	26.92
21-Apr-03	1202	14.41	5.72	7.21	15.02
21-Apr-03	1203	14.67	5.43	6.71	57.89
21-Apr-03	1204	14.25	5.89	6.38	74.60
21-Apr-03	1205	13.89	6.23	7.69	0.95
21-Apr-03	1206	13.92	6.20	7.80	0.00
21-Apr-03	1207	13.83	6.30	7.92	0.00
21-Apr-03	1208	13.87	6.26	7.93	0.00
21-Apr-03	1209	13.95	6.16	7.87	0.00
21-Apr-03	1210	14.11	6.00	7.64	0.26
21-Apr-03	1211	13.96	6.16	7.51	0.75
21-Apr-03	1212	14.24	5.87	7.62	4.65
21-Apr-03	1213	14.06	6.06	7.36	13.24
21-Apr-03	1214	14.19	5.93	7.44	5.09
21-Apr-03	1215	14.24	5.88	7.43	9.35

21-Apr-03	1216	14.33	5.80	7.05	32.59
21-Apr-03	1217	14.00	6.13	7.43	4.66
21-Apr-03	1218	14.07	6.05	7.52	1.29
21-Apr-03	1219	13.84	6.28	7.52	0.27
21-Apr-03	1220	13.69	6.42	7.88	0.00
21-Apr-03	1221	14.00	6.12	7.71	0.12
21-Apr-03	1222	14.10	6.02	7.54	0.50
21-Apr-03	1223	14.20	5.93	7.25	6.46
21-Apr-03	1232	14.34	5.75	7.01	4.97
21-Apr-03	1233	14.49	5.60	6.96	12.07
21-Apr-03	1234	14.22	5.89	6.79	30.53
21-Apr-03	1235	13.90	6.20	7.51	4.45
21-Apr-03	1236	13.95	6.16	7.63	0.00
21-Apr-03	1237	14.21	5.90	7.53	2.23
21-Apr-03	1238	13.91	6.20	7.47	1.59
21-Apr-03	1239	13.89	6.21	7.61	0.73
21-Apr-03	1240	13.82	6.28	7.85	0.00
21-Apr-03	1241	13.96	6.15	7.58	1.37
21-Apr-03	1242	13.92	6.19	7.59	0.99
21-Apr-03	1243	13.79	6.32	7.64	0.72
21-Apr-03	1244	13.87	6.24	7.67	0.19
21-Apr-03	1245	13.74	6.36	7.76	0.00
21-Apr-03	1246	13.69	6.41	8.13	0.00
21-Apr-03	1247	14.04	6.07	7.83	0.14
21-Apr-03	1248	14.13	5.99	7.36	19.52
21-Apr-03	1249	14.20	5.91	7.31	9.94
21-Apr-03	1250	13.99	6.14	7.44	7.03
21-Apr-03	1251	14.09	6.02	7.93	0.38
21-Apr-03	1252	14.15	5.97	7.55	7.15
21-Apr-03	1253	14.32	5.79	7.06	53.68
21-Apr-03	1254	14.16	5.95	7.39	15.89
21-Apr-03	1255	14.03	6.09	7.71	1.85
21-Apr-03	1256	14.25	5.86	7.75	0.94
21-Apr-03	1257	14.29	5.82	7.35	6.22
21-Apr-03	1258	14.29	5.82	7.44	12.43
21-Apr-03	1259	13.93	6.19	7.46	19.21
21-Apr-03	1300	13.85	6.28	8.27	0.00
21-Apr-03	1301	13.90	6.23	7.92	0.12
21-Apr-03	1302	13.91	6.23	7.75	2.45

Facility: Bradley Landfill
Source: Flare #1
Job No.: W07-035
Test Date: 04/23/03

PRETEST				
LEAK CHECK	PASSED			
	** LINEARITY CHECK **			
RANGE :	25 O2	20 CO2	100 CO	25 NOx
ZERO				
Instrument	0.00	0.00	0.0	0.00
Cylinder	0.00	0.00	0.0	0.00
Difference (%)	0.00	0.00	0.0	0.00
LOW LEVEL				
Instrument				
Cylinder				
Difference (%)				
MID LEVEL				
Instrument	12.00	6.96	50.0	10.55
Cylinder	12.01	7.00	50.4	10.40
Difference (%)	-0.04	-0.20	-0.4	0.60
HIGH LEVEL				
Instrument	20.50	12.00	80.0	21.00
Cylinder	20.90	12.01	79.2	21.00
Difference (%)	-1.60	-0.05	0.8	0.00

SYSTEM BIAS
PreTest
NOx
10.25
10.55
-1.20
pass
O2
12.00
12.00
0.00
pass
CO
50.0
50.0
0.0
pass
CO2
6.92
6.96
-0.20
pass

POST TEST				
LEAK CHECK	PASSED			
	O2	CO2	CO	NOx
ZERO				
Instrument	0.00	0.00	0.0	0.00
Cylinder	0.00	0.00	0.0	0.00
Difference (%)	0.00	0.00	0.0	0.00
LOW LEVEL				
Instrument				
Cylinder				
Difference (%)				
MID LEVEL				
Instrument	12.00	7.04	50.0	10.45
Cylinder	12.01	7.00	50.4	10.40
Difference (%)	-0.04	0.20	-0.4	0.20
HIGH LEVEL				
Instrument	20.68	12.10	80.0	20.75
Cylinder	20.90	12.01	79.2	21.00
Difference (%)	-0.90	0.45	0.8	-1.00

Post test
NOx
10.25
10.45
-0.80
pass
O2
11.90
12.00
-0.40
pass
CO
49.8
50.0
-0.2
pass
CO2
7.02
7.04
-0.10
pass

System Response Time (seconds)			
	#1	#2	#3
Upscale			
NOx	52	51	50
CO	54	58	52
O2	23	22	20
CO2	20	20	23
Downscale			
NOx	50	50	50
CO	53	55	51
O2	21	21	17
CO2	18	17	21

NO2 to NO Converter Effeciency (%)			
	cylinder	instr.	effeciency
ppm	18.1	17.05	94.20

Table 5-2
Trace Organic Species
Destruction Efficiency Results
Waste Management - Bradley Landfill
Flare #1
April 23, 2003

		INLET Flow rate	3531	dscfm		OUTLET Flow rate	42330.5	dscfm
Species	Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)		Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)	Dest. Eff. (%)
Hydrogen Sulfide	48400	1.97E+00	9.21E-01		< 500	< 2.04E-02	< 1.14E-01	> 87.62
Benzene	2890	2.69E-01	1.26E-01		< 0.3	< 2.80E-05	< 1.57E-04	> 99.88
Benzychloride	< 40	< 6.07E-03	< 2.84E-03		< 0.8	< 1.21E-04	< 6.80E-04	NA
Chlorobenzene	211	2.85E-02	1.33E-02		< 0.3	< 4.05E-05	< 2.27E-04	> 98.30
Dichlorobenzenes	1480	2.60E-01	1.21E-01		< 1.1	< 1.93E-04	< 1.08E-03	> 99.11
1.1-dichloroethane	796	9.42E-02	4.40E-02		< 0.3	< 3.55E-05	< 1.99E-04	> 99.55
1.2-dichloroethane	134	1.59E-02	7.41E-03		< 0.3	< 3.55E-05	< 1.99E-04	> 97.32
1.1-dichloroethylene	162	1.88E-02	8.77E-03		< 0.3	< 3.48E-05	< 1.95E-04	> 97.78
Dichloromethane	5300	5.38E-01	2.52E-01		< 0.3	< 3.05E-05	< 1.71E-04	> 99.93
1.2-Dibromoethane	< 16	< 3.59E-03	< 1.68E-03		< 0.3	< 6.74E-05	< 3.77E-04	NA
Perchloroethene	3320	9.40E-01	4.39E-01		< 0.2	< 5.66E-05	< 3.17E-04	> 99.93
Carbon tetrachloride	< 20	< 3.68E-03	< 1.72E-03		< 0.2	< 3.68E-05	< 2.06E-04	NA
Toluene	66200	7.28E+00	3.40E+00		< 0.8	< 8.80E-05	< 4.93E-04	> 99.99
1.1.1-trichloroethane	59.2	9.41E-03	4.40E-03		< 0.2	< 3.18E-05	< 1.78E-04	> 95.95
Trichloroethene	1380	2.16E-01	1.01E-01		< 0.2	< 3.13E-05	< 1.75E-04	> 99.83
Chloroform	< 16	< 2.28E-03	< 1.06E-03		< 0.2	< 2.84E-05	< 1.59E-04	NA
Vinyl Chloride	454	3.39E-02	1.58E-02		< 0.3	< 2.24E-05	< 1.25E-04	> 99.21
m+p-xylenes	29800	3.78E+00	1.76E+00		< 0.5	< 6.33E-05	< 3.55E-04	> 99.98
o-xylene	7730	9.79E-01	4.57E-01		< 0.3	< 3.80E-05	< 2.13E-04	> 99.95
TNMHC	10187217	1.95E+02	9.10E+01		2755	5.27E-02	2.95E-01	99.68

Note: All values preceded by "<" are below the detection limit. The reported values are the detection limit.
NA–Not Applicable: Destruction efficiency can not be calculated since both inlet and outlet values are below the detection limit.

APPENDIX C - Laboratory Results

AtmAA Inc.
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LABORATORY ANALYSIS REPORT

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Organic Carbon Analysis in Water Impingers, and Methane and TGNMO Analysis in SUMMA Canister Samples from Impinger/Canister Train Sample Collection

Report Date: April 30, 2003
Client: Horizon / Waste Management
P.O. No.: Verbal
Client Project No.: W07-035
Source Location : Bradley Landfill / Sun Valley CA.
Source ID: Flare 1 outlet

Date Received: April 23, 2003
Date Analyzed: April 25, 2003

ANALYSIS DESCRIPTION

Methane & TGNMO were measured by flame ionization detection/total combustion analysis (FID/TCA), Method 25. Organic carbon in water impinger samples were measured by Dohrman total organic carbon analyzer, water FID/TCA.

AtmAA Lab No.	Sample ID	Canister Methane	Canister Ethane	Canister TGNMO	Impinger Organic Carbon as Methane	Impinger Volume	P_1	P_2
		(Concentration in ppmv)				*(ml)*		
01133-18	SUMMA S12	<1	<1	2.63	---	---	592	803
	Impinger H211	---	---	---	0.36	2.80	---	---
01133-19	SUMMA S16	<1	<1	2.14	---	---	581	800
	Impinger H212	---	---	---	0.38	2.88	---	---

TGNMO is total gaseous non-methane organics (excluding ethane), reported as ppm methane.
** Note - Impinger sample results are not blank corrected. The field blank (impinger H56) contained 0.27 ug carbon as methane, corresponding to 0.09 ppm methane for a 4.78 liter*
P_1 and P_2 are initial and final pressures measured in mm Hg.

Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY
(Repeat Analyses)

Project No.: W07-035
Date Received: April 23, 2003
Date Analyzed: April 25, 2003

Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in ppmv)			
Methane	SUMMA S12	<1	<1	---	---
	SUMMA S16	<1	<1	---	---
Ethane	SUMMA S12	<1	<1	---	---
	SUMMA S16	<1	<1	---	---
TGNMO	SUMMA S12	2.60	2.66	2.63	1.1
	SUMMA S16	2.10	2.17	2.14	1.6
Impinger TOC	Impinger H211	0.36	0.36	0.36	0.0
	Impinger H212	0.37	0.39	0.38	2.6

A set of 2 canister/impinger samples, laboratory numbers 01133-(18 & 19), was analyzed for methane, total gaseous non-methane organics (TGNMO), and TOC. Agreement between repeat analysis is a meaure of precision and is shown in the column "% Difference from Mean". Repeat analyses are an important part of AtmAA's quality assurance program. The average % Difference from Mean for 4 repeat measurements from the sample set of 2 canister/impinger samples is 1.4%.

040

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LABORATORY ANALYSIS REPORT

CO, CH_4, CO_2, TGNMO, and Ethane Analysis in Tanks
and Traps by SCAQMD Method 25 (FID/TCA)

Report Date: April 29, 2003
Client: Horizon / Waste Management
P.O. No.: Verbal
Client Project No.: W07-035
Source Location: Bradley Landfill / Sun Valley CA.
Source ID: Flare 1 inlet

Date Received: April 22, & 25, 2003
Date Analyzed: April 24, & 25, 2003

AtmAA Lab No.	Sample ID			tank CO	tank CH_4	tank CO_2	tank TGNMO	CO2 in ICV	tank Oxygen	P_1	P_2
	Tank	Trap	ICV	(Concentrations in ppmv)					(%)		
01133-20	A	R	Y	52.3	391000	337000	856	28700	2.69	455	800
01133-21	D	O	N	54.5	390000	333000	838	29800	2.95	437	800
trap burn system blank			H					8.69			

TGNMO is total gaseous non-methane organics (excluding ethane) reported as ppm methane.
No ethane was found at a lower detection limit of 20 ppmv as methane.

P_1 - Initial Pressure, mm Hg
P_2 - Final Pressure, mm Hg

Michael L. Porter
Laboratory Director

041

QUALITY ASSURANCE SUMMARY

(Repeat Analyses)

Client Project No.: W07-035
Date Received: April 22, & 25, 2003
Date Analyzed: April 24, & 25, 2003

Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in ppmv)			
CO	TK A	52.5	52.2	52.3	0.32
CH_4	TK A	391000	390000	391000	0.08
CO_2	TK A	335000	339000	337000	0.51
TGNMO	TK A	841	871	856	1.8
CO_2 in ICV (in trap, transfer tanks)	ICV Y	29200	28200	28700	1.8
		(Concentration in %v)			
Oxygen	TK E	2.69	2.69	2.69	0.0

A set of 2 TCA samples, laboratory numbers 01133-(20 & 21), was analyzed for CO, CH_4, CO_2, O2, and total gaseous non-methane organics (TGNMO). Agreement between repeat analyses is a measure of precision and is shown above in the column "% Difference from Mean". Repeat analyses are an important part of AtmAA's quality assurance program. The average % Difference from Mean for 6 repeat measurements from the sample set of 2 TCA samples is 0.74%.

Gas standards (containing CO, CH_4, CO_2 and propane) used for TCA analyses, were prepared and certified by Praxair.

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LABORATORY ANALYSIS REPORT

SCAQMD Rule 1150.1 Components Analysis in Inlet Gas Tedlar Bag Sample

Report Date: May 1, 2003
Client: Horizon
Project Location: WMNA / Bradley LF #1
Client Project No.: W07-035
Date Received: April 23, 2003
Date Analyzed: April 23 & 24, 2003

AtmAA Lab No.:	01133-22
Sample I.D.:	W07035-F1
	TB-IN-A
Components	*(Concentration in ppmv)*
Hydrogen sulfide	48.4
	(Concentration in ppbv)
Benzene	2890
Benzylchloride	<40
Chlorobenzene	211
Dichlorobenzenes*	1480
1,1-dichloroethane	796
1,2-dichloroethane	134
1,1-dichloroethylene	162
Dichloromethane	5300
1,2-dibromoethane	<16
Perchloroethene	3320
Carbon tetrachloride	<20
Toluene	66200
1,1,1-trichloroethane	59.2
Trichloroethene	1380
Chloroform	<16
Vinyl chloride	454
m + p-xylenes	29800
o-xylene	7730

* *total amount containing meta, para, and ortho isomers*

Michael L. Porter
Laboratory Director

043

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LABORATORY ANALYSIS REPORT

Hydrogen Sulfide and Reduced Sulfur Compounds
Analysis in Inlet Tedlar Bag Sample

Report Date: May 1, 2003
Client: Horizon
Project Location: WMNA / Bradley LF #1
Client Project No.: W07-035
Date Received: April 23, 2003
Date Analyzed: April 23, 2003

ANALYSIS DESCRIPTION

Hydrogen sulfide was analyzed by gas chromatography with a Hall electrolytic conductivity detector operated in the oxidative sulfur mode. All other components were measured by GC/ Mass Spec.

	AtmAA Lab No.:	01133-22
	Sample I.D.:	W07035-F1
		TB-IN-A
Components		*(Concentration in ppmv)*
Hydrogen sulfide		48.4
Carbonyl sulfide		0.42
Methyl mercaptan		3.16
Ethyl mercaptan		<0.09
Dimethyl sulfide		9.50
Carbon disulfide		0.22
isopropyl mercaptan		0.28
n-propyl mercaptan		<0.06
Dimethyl disulfide		0.22
TRS		62.6

TRS - total reduced sulfur

Michael L. Porter
Laboratory Director

044

QUALITY ASSURANCE SUMMARY

(Repeat Analyses)

Client Project No.: W07-035
Date Received: April 23, 2003
Date Analyzed: April 23 & 24, 2003

Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in ppbv)			
Benzene	TB-IN-A	2800	2980	2890	3.1
Benzylchloride	TB-IN-A	<40	<40	---	---
Chlorobenzene	TB-IN-A	225	197	211	6.6
Dichlorobenzenes	TB-IN-A	1530	1420	1480	3.7
1,1-dichloroethane	TB-IN-A	756	835	796	5.0
1,2-dichloroethane	TB-IN-A	142	127	134	5.6
1,1-dichloroethylene	TB-IN-A	153	170	162	5.3
Dichloromethane	TB-IN-A	5110	5480	5300	3.5
1,2-dibromoethane	TB-IN-A	<16	<16	---	---
Perchloroethene	TB-IN-A	3180	3470	3320	4.4
Carbon tetrachloride	TB-IN-A	<20	<20	---	---
Toluene	TB-IN-A	62900	69400	66200	4.9
1,1,1-trichloroethane	TB-IN-A	52.4	65.9	59.2	11
Trichloroethene	TB-IN-A	1350	1420	1380	2.5
Chloroform	TB-IN-A	<16	<16	---	---
Vinyl chloride	TB-IN-A	363	333	454	3.3
m + p-xylenes	TB-IN-A	29800	29700	29800	0.17
o-xylene	TB-IN-A	7220	8240	7730	6.6

QUALITY ASSURANCE SUMMARY

(Repeat Analyses)

(continued)

Sulfur Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in ppmv)			
Hydrogen sulfide	TB-IN-A	47.7	49.2	48.4	1.5
Carbonyl sulfide	TB-IN-A	0.42	0.41	0.42	1.2
Methyl mercaptan	TB-IN-A	3.16	3.17	3.16	0.16
Ethyl mercaptan	TB-IN-A	<0.09	<0.09	---	---
Dimethyl sulfide	TB-IN-A	9.54	9.47	9.50	0.37
Carbon disulfide	TB-IN-A	0.22	0.21	0.22	2.3
iso-propyl mercaptan	TB-IN-A	0.27	0.28	0.28	1.8
n-propyl mercaptan	TB-IN-A	<0.06	<0.06	---	---
Dimethyl disulfide	TB-IN-A	0.24	0.20	0.22	9.1

One Tedlar bag sample, laboratory number 01133-22, was analyzed for SCAQMD Rule 1150.1 components, hydrogen sulfide, and total reduced sulfur compounds. Agreement between repeat analyses is a measure of precision and is shown above in the column "% Difference from Mean". Repeat analyses are an important part of AtmAA's quality assurance program. The average % Difference from Mean for 21 repeat measurements from the one Tedlar bag sample is 3.9%.

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LABORATORY ANALYSIS REPORT

SCAQMD Rule 1150.1 Components Analysis in Outlet Tedlar Bag Sample

Report Date: May 1, 2003
Client: Horizon
Project Location: WMNA / Bradley LF #1
Client Project No.: W07-035
Date Received: April 23, 2003
Date Analyzed: April 23 & 24, 2003

AtmAA Lab No.:	01133-23
Sample I.D.:	W07035-F3
	TB-OUT-A
Components	*(Concentration in ppbv)*
Hydrogen sulfide	<500
Benzene	<0.3
Benzylchloride	<0.8
Chlorobenzene	<0.3
Dichlorobenzenes*	<1.1
1,1-dichloroethane	<0.3
1,2-dichloroethane	<0.3
1,1-dichloroethylene	<0.3
Dichloromethane	<0.3
1,2-dibromoethane	<0.3
Perchloroethene	<0.2
Carbon tetrachloride	<0.2
Toluene	<0.8
1,1,1-trichloroethane	<0.2
Trichloroethene	<0.2
Chloroform	<0.2
Vinyl chloride	<0.3
m + p-xylenes	<0.5
o-xylene	<0.3

** total amount containing meta, para, and ortho isomers*

Michael L. Porter
Laboratory Director

047

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Waste Mgt. / Bradley LF #1	Sun Valley, CA
Project No. W07-035	**Field Logbook No.**
Sampler: (*Signature*) [signature]	**Chain of Custody Tape No.**

ANALYSES

Sample No./ Identification	~~Date~~	Date ~~Time~~	Lab Sample Number	Type of Sample	SCAQMD M25.3	SCAQMD M25.1 (TCA complete)	SCAQMD M307.91 (TRS) as H2S	Rule 1150.1 List	Trap/Imp #	02	REMARKS
Summa 512		4/23/03	01133-18	6 L summa	X				H211		Flare #1 outlet
516		↓	-19	↓	X				H212		↓ Blank# HS
Tank A		↓	-20	12 L Tank		X			R	X	Flare #1 Inlet
B		↓	-21	↓		X			O	X	↓
W0735-F1-TB-IN-A		↓	-22	5 L tedlar Bag			X	X			Flare #1 Inlet
W0735-F1-TB-IN-B		↓		↓							Hold as Back Up
W0735-F1-TB-OUT-A		↓	-23	↓				X			Flare #1 Outlet
W0735-F1-TB-OUT-B		↓		↓							Hold as Backup

Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
[signature]	4/23/03	1225	[signature]	4/23/03	1225
Relinquished by: (*Signature*) [signature]	4/23/03	1340	**Received by: (*Signature*)** [signature]	4-23-03	13:40
Relinquished by: (*Signature*)	**Date**	**Time**	**Received for Laboratory: (*Signature*)**	**Date**	**Time**
Sample Disposal Method:			**Disposed of by: (*Signature*)**	**Date**	**Time**

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

Atm AA
Calabasas, CA

№ 7861

048

Facility: Waste Management/Bradley
Source: Flare 1
Job No.: W07-035
Test Date: 04/21-23/03

SCAQMD Method 5.1

DATA SHEET FOR PARTICULATE MATTER SCAQMD METHOD 5.1

DATE SAMPLED: 04/21-23/03
DATE EXTRACTED: 04/22-24/03

RUN #1

	SAMPLE ID	BEAKER/ FILTER ID	VOLUME	INITIAL	FINAL	NET WEIGHT(g)
A - FILTER CATCH	W07035-5.1-F1-PF-1	G00200	NA	0.0833	0.0836	0.0003
FILTER ACID						0.0000
FILTER SULFATE						
B - PROBE CATCH						0.0000
PROBE ACID						0.0000
PROBE SULFATE						
						0.0000
C - IMP.CATCH(INSOL)	W07035-5.1-F1-EF-1	G03028	620	0.0817	0.0825	0.0008
INSOLUBLE ACID						0.0000
INSOLUBLE SULFATE						0.0000
D - IMP. CATCH (SOL)	W07035-5.1-F1-DI-1	030034	620	29.3473	29.3523	0.0050
SOLUBLE ACID						0.0000
SOLUBLE SULFATE						0.0000
E - ORGANIC EXTRACT	W07035-5.1-F1-MC-1	030047	125	30.5883	30.5882	0.0000

TOTAL PARTICULATE	(A+B+C+D+E)	0.0061
SOLID PARTICULATE	(A+B+C+D)	0.0061

DATA SHEET FOR PARTICULATE MATTER SCAQMD METHOD 5.1

DATE SAMPLED: 04/21-23/03
DATE EXTRACTED: 04/22-24/03

RUN #2

	SAMPLE ID	BEAKER/ FILTER ID	VOLUME	INITIAL	FINAL	NET WEIGHT(g)
A - FILTER CATCH	W07035-5.1-F1-PF-2	G00198	NA	0.0845	0.0851	0.0006
FILTER ACID						0.0000
FILTER SULFATE						
						0.0000
B - PROBE CATCH						0.0000
PROBE ACID						
PROBE SULFATE						0.0000
C - IMP.CATCH(INSOL)	W07035-5.1-F1-EF-2	G03029	556	0.0820	0.0833	0.0013
INSOLUBLE ACID						0.0000
INSOLUBLE SULFATE						0.0000
D - IMP. CATCH (SOL)	W07035-5.1-F1-DI-2	030036	556	30.3478	30.3518	0.0040
SOLUBLE ACID						0.0000
SOLUBLE SULFATE						0.0000
E - ORGANIC EXTRACT	W07035-5.1-F1-MC-2	030041	125	30.5197	30.5196	0.0000

TOTAL PARTICULATE	(A+B+C+D+E)	0.0059
SOLID PARTICULATE	(A+B+C+D)	0.0059

DATA SHEET FOR PARTICULATE MATTER SCAQMD METHOD 5.1

DATE SAMPLED: 04/21-23/03
DATE EXTRACTED: 04/22-24/03

BLANK

	SAMPLE ID	BEAKER/ FILTER ID	VOLUME	INITIAL	FINAL	NET WEIGHT(g)
A - FILTER CATCH	PF-BLANK	G003021	NA	0.0846	0.0845	0.0000
FILTER ACID						0.0000
FILTER SULFATE						0.0000
B - PROBE CATCH						0.0000
PROBE ACID						0.0000
PROBE SULFATE						0.0000
C - IMP.CATCH(INSOL)	EF-BLANK	G03023	1000	0.0856	0.0852	0.0000
INSOLUBLE ACID						0.0000
INSOLUBLE SULFATE						0.0000
D - IMP. CATCH (SOL)	DI-BLANK	030024	1000	29.3816	29.3816	0.0000
SOLUBLE ACID						0.0000
SOLUBLE SULFATE						0.0000
E - ORGANIC EXTRACT	MC-BLANK	030027	125	30.4833	30.4830	0.0000

TOTAL PARTICULATE	(A+B+C+D+E)	0.0000
SOLID PARTICULATE	(A+B+C+D)	0.0000

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
WASTE MANAGEMENT / BRADLEY L.F.	SUN VALLEY, CA
Project No.	**Field Logbook No.**
W07.035	
Sampler: (*Signature*)	**Chain of Custody Tape No.**

ANALYSES: SCAQMD 5.1

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample						REMARKS
W07.035.5.1-PI-PF1	02-24-03				✓					
-DI1					✓					
-PF2					✓					
-DI2					✓					

Relinquished by: (*Signature*)	**Date**	**Time**	**Received by: (*Signature*)**	**Date**	**Time**
	04-24-03	1600 FF		04-24-03	1500
Relinquished by: (*Signature*)	**Date**	**Time**	**Received by: (*Signature*)**	**Date**	**Time**
Relinquished by: (*Signature*)	**Date**	**Time**	**Received for Laboratory: (*Signature*)**	**Date**	**Time**
Sample Disposal Method:	**Disposed of by: (*Signature*)**			**Date**	**Time**

SAMPLE COLLECTOR

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

ANALYTICAL LABORATORY

№ 7780

GSU

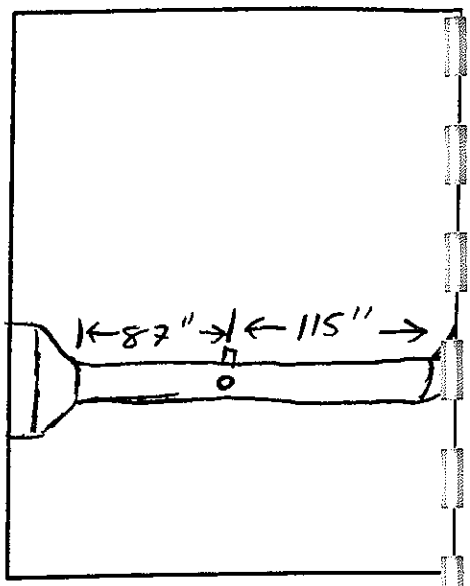
APPENDIX D - Field Data Sheets

Facility:	Bradley LF	**Baro. Press:**	29.17	**D_1 upstream:**	6.6
Source:	Flare #1 Inlet	**Static Press:**	+10.0	**D_1 downstream:**	8.7
Job #:	W07-035	**Pitot Tube #:**	18'S-Type	**Stack Diameter:**	13.25
Date:	4/23/03	**Pitot Tube Type:**	S-Type	**Leak Check**	
Operator:	SB, TW	**Magnahelic:**	#1	**Initial:**	**Final:**
Run #:	1, 2			J/J	J/J

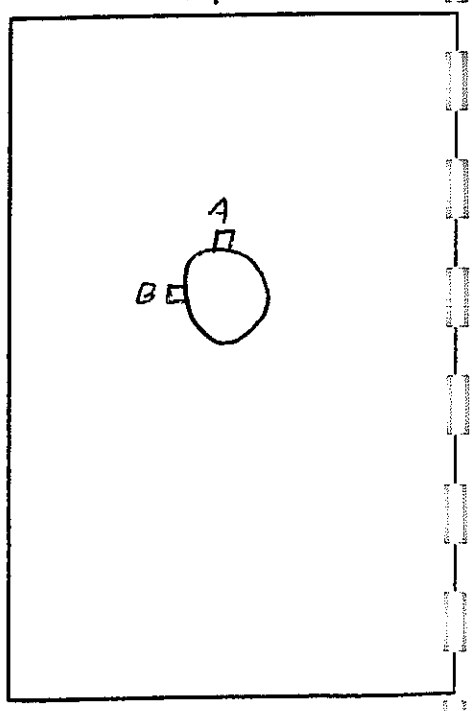
1 2 1 2

Point #	Position in.	Velocity Head in. H_2O		Stack Temp °F		Cyclonic Flow Angle
A 6	12.7	1.0	1.1	141	143	
5	11.3	1.3	1.4	141	143	
4	9.3	1.2	1.3	141	143	
3	3.9	1.2	1.1	141	143	
2	1.9	1.1	1.1	141	143	
1	0.6	1.0	1.0	141	143	
B 6		1.0	1.0	141	143	
5		1.1	1.0	141	143	
4		1.2	1.1	141	143	
3		1.1	1.2	141	143	
2		1.1	1.1	141	143	
1		1.1	1.1	141	143	
Average		$\sqrt{\Delta P}$=		T_s=		∠=
		1.0559 / 1.0593		141.0	143.0	
		SB	SB	SB	SB	

Side View



Top View



PARTICULATE FIELD DATA

PLANT Bradley LF
DATE 4-23-03
LOCATION Sun Valley, CA
OPERATOR SB TW
SOURCE Flare #1 Inlet
RUN NO. 1 MM.1
SAMPLE BOX NO. C7

TIME START 10:12

METER BOX NO. 5
METER ΔH@ 1.6807
Y= 0.9873
PROBE I.D. NO. –
NOZZLE DIAMETER, in. –
STACK DIAMETER, in. –
PROBE HEATER SETTING –
HEATER BOX SETTING –
Δ Cp FACTOR –
FILTER NO. –

ASSUMED MOISTURE, % –
AMBIENT TEMPERATURE 65°F
BARO. PRESS. 29.17
STATIC PRESS. – .
NOMAGRAPH INDEX –

PRE TEST LEAK CHECKS
METER 0.005 @ 15 in. Hg
PITOTS – @ in. Hg
ORSAT –

P#	TIME	T_s °F	Δ P in H_2O	√Δ P	Δ H in H_2O	Vm ft^3	$T_{m\,IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
					1.7 TV		70	70			
Single	00	↓	↓	↓	~~1.8~~	561.557	~~64~~ T	~~64~~ T	↓	50	2
	10				1.7	569.9	74	72		53	2
	20				1.7	577.1	81	74		53	2
	30				1.7	585.2	87	77		55	2
	40				1.7		90	79		55	2
	50				1.7	600.4	93	80		56	2
	60				~~1.7~~	608.402	—	—		~~56~~ T	~~2~~ T
Avg.					1.70	46.845		78.8			

TIME END = 1112

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
Final	124	106	2		277
Initial	100	100	0		257
Liquid Collected	24	6	2		20
Total Vol. Collected					52

POST TEST LEAK CHECKS
Meter 0.005 @ 15 in. Hg
Pitots NA @ in. Hg
Orsat NA

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					

Nozzle Cal	D_1	D_2	D_3	Average

PARTICULATE FIELD DATA

PLANT Bradley LF
DATE 4-23-03
LOCATION Sun Valley, CA
OPERATOR SG, TW
SOURCE Flare #1 Inlet
RUN NO. 2 M4.1
SAMPLE BOX NO. C7

TIME START 1153

METER BOX NO. 5
METER ΔH @ 1.6807
Y= 0.9873
PROBE I.D. NO. —
NOZZLE DIAMETER, in. —
STACK DIAMETER, in. —
PROBE HEATER SETTING —
HEATER BOX SETTING —
Δ Cp FACTOR —
FILTER NO. —

ASSUMED MOISTURE, % —
AMBIENT TEMPERATURE 65 °F
BARO. PRESS. 22.17
STATIC PRESS. —
NOMAGRAPH INDEX —

PRE TEST LEAK CHECKS
METER .005 @ 15 in. Hg
PITOTS — @ — in. Hg
ORSAT —

P#	TIME	T_s °F	ΔP in H_2O	√ΔP	ΔH in H_2O	Vm ft^3	$T_{m\,IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
Single	00	↓	↓	↓	1.7	610.958	80	80	↓	52	2
	10				1.7	618.6	91	81		53	2
	20				1.7	626.3	93	82		52	2
	30				1.7	634.1	94	82		86	2
	40				1.7	641.5	94	83		52	2
	50				1.7	649.2	94	83		57	2
	60	STOP ⇒			~~1.7~~	657.773	—	—		~~54~~	—
Avg.					1.70	46.815		86.4			

TIME END = 1253

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
Final	140	104	3		273
Initial	100	100	0		255
Liquid Collected	40	4	3		18
Total Vol. Collected					65

POST TEST LEAK CHECKS
Meter .005 @ 15" in. Hg
Pitots — @ — in. Hg
Orsat —

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					

Nozzle Cal	D_1	D_2	D_3	Average

PARTICULATE FIELD DATA

PLANT Bradley LF
DATE 4-23-03
LOCATION Sun Valley, CA
OPERATOR SB, TW, CSA
SOURCE Flare #1 Outlet
RUN NO. 1 MS.1
SAMPLE BOX NO. C3

TIME START 1012

METER BOX NO. 4
METER ΔH @ 1.7693
Y= 0.9876
PROBE I.D. NO. 10-2
NOZZLE DIAMETER, in. 0.976
STACK DIAMETER, in. 144"
PROBE HEATER SETTING —
HEATER BOX SETTING —
Δ Cp FACTOR 0.84
FILTER NO. 600200

ASSUMED MOISTURE, % 12
AMBIENT TEMPERATURE 65°F
BARO. PRESS. 29.17
STATIC PRESS. -0.005
NOMAGRAPH INDEX 200

PRE TEST LEAK CHECKS
METER 1.005 @ 16 in. Hg
PITOTS N/A @ 3/3 in. Hg
ORSAT —

P#	TIME	T_s °F	ΔP in H_2O	√ΔP	ΔH in H_2O	Vm ft^3	$T_{m\,IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
A 12	0.0	1517	0.02		4.0	424.885	69 70	69 70		53	7
11	2.5	1513	0.02		4.0	427.5	80 71	74 70		54 54	7
10	5.0	1520	0.02		4.0	430.4	72	71		56	7
9	7.5	1525	0.02		4.0	433.7	73	71		56	7
8	10.0	1523	0.02		4.0	436.1	73	71		56	7
7	12.5	1518	0.02		4.0	438.9	74	71		52	7
6	15.0	1517	0.02		4.0	441.7	74	72		56	7
5	17.5	1515	0.02		4.0	444.6	75	72		57	7
4	20.0	1522	0.02		4.0	447.4	75	72		57	7
3	22.5	1551	0.02		4.0	450.3	75	72		56	7
2	25.0	1554	0.02		4.0	453.2	76	73		56	7
1	27.5	1530	0.02		4.0	455.9	76	74		52	7
B 12	30.0	1545	0.02	Box change	4.0	458.660	75	72		54	7
11	32.5	1526	0.02		4.0	461.8	76	73		55	7 1/2
10	35.0	1515	0.02		4.0	464.4	76	74		56	7 1/2
9	37.5	1524	0.02		4.0	467.3	76	74		56	7
8	40.0	1532	0.02		4.0	470.1	77	74		56	7
7	42.5	1520	0.02		4.0	473.2	77	74		57	7
6	45.0	1513	0.02		4.0	44-	77	74		57	7
5	47.5	1532	0.02		4.0	478.7	77	74		57	7
4	50.0	1520	0.02		4.0	481.5	77	74		59	7
3	52.5	1518	0.02		4.0	484.3	77	74		57	7
2	55.0	1523	0.02		4.0	467.2	77	74		57	7
1	57.5	1515	0.02		4.0	490.3	77	75		56	7
	60.0	—	—		—	492.915	—	—		—	—
Avg.		1525.8		0.1414	4.0	68.030	73.9				

TIME END = 11:22 SB — SB — SB — SB — SB

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght.
Final	184	127	9		274
Initial	100	100	0		256
Liquid Collected	84	27	9		18
Total Vol. Collected					138

SB

POST TEST LEAK CHECKS
Meter 1.005 @ 15 in. Hg
Pitots ✓ @ ✓ in. Hg
Orsat —

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					

Nozzle Cal	D_1	D_2	D_3	Average
	0.976	0.975	0.976	0.976

PARTICULATE FIELD DATA

PLANT Bradley L F
DATE 4-23-03
LOCATION Sun Valley CA
OPERATOR SB TW CSM
SOURCE Flare #1 Outlet
RUN NO. 2 MS.1
SAMPLE BOX NO. C11

TIME START 1153

METER BOX NO. 4
METER ΔH @ 1.7693
Y= 0.9876
PROBE I.D. NO. 10-2
NOZZLE DIAMETER, in. 0.976
STACK DIAMETER, in. 144"
PROBE HEATER SETTING —
HEATER BOX SETTING —
Δ Cp FACTOR 0.84
FILTER NO. G00198

ASSUMED MOISTURE, % 12
AMBIENT TEMPERATURE 65°F
BARO. PRESS. 22.17
STATIC PRESS. -0.005
NOMAGRAPH INDEX 200

PRE TEST LEAK CHECKS
METER 0.005 @ 15 in. Hg
PITOTS ✓✓ @ 4" in. Hg
ORSAT NA

P#	TIME	T_s °F	ΔP in H_2O	√ΔP	ΔH in H_2O	Vm ft^3 497.327	$T_{m\,IN}$ °F	T_m OUT °F	OVEN °F	IMP. OUT °F	VAC (in Hg
A 12	0.0	1541	0.02		4.0	~~496.744~~	66	66		53	7
11	2.5	1511	0.02		4.0	499.6	67	66		53	7
10	5.0	1509	0.02		4.0	502.3	68	66		54	7
9	7.5	1497	0.02		4.0	505.2	69	~~68~~ 66		54	7
8	10.0	1513	0.02		4.0	507.9	~~70~~	67		54	7
7	12.5	1520	0.02		4.0	510.6	71	67		54	7
6	15.0	1526	0.02		4.0	513.16	71	68		55	7
5	17.5	1531	0.02		4.0	516.1	71	68		56	7
4	20.0	1540	0.02		4.0	518.7	71	68		56	7
3	22.5	1522	0.02		4.0	521.4	72	69		57	7
2	25.0	1515	0.02		4.0	524.2	72	69		57	7
1	27.5	1516	0.02		4.0	526.8	72	69		57	7
B 12	30.0	1539	0.02		4.0	529.563	70	67		54	7
11	32.5	1552	0.02		4.0	532.4	71	68		54	7
10	35.0	1540	0.02		4.0	535.2	71	68		56	7
9	37.5	1539	0.02		4.0	537.9	72	68		56	7
8	40.0	1524	0.02		4.0	540.8	72	69		56	7
7	42.5	1509	0.02		4.0	543.6	73	70		56	7
6	~~45.0~~	1504	0.02		4.0	546.2	73	70		56	7
5	47.5	1515	0.02		4.0	549.2	73	70		57	7
4	50.0	1526	0.02		4.0	551.9	74	71		57	7
3	52.5	1530	0.02		4.0	554.7	74	71		57	7
2	55.0	1522	0.02		4.0	557.6	74	71		57	7
1	57.5	1514	0.02		4.0	560.3	74	71		56	7
	60.0	—	—		—	563.246	—	—		—	—
Avg.		1523.1		0.1414	4.0	65.869	69.9				

TIME END = SB SB SB SB SB

Volume of Liquid Water Collected	Impinger Volume 1	2	3	4	Silica Gel Wght. 5
Final	187	124	9		289
Initial	100	100	0		268
Liquid Collected	87	24	9		21.0
Total Vol. Collected					141

SB

POST TEST LEAK CHECKS
Meter 0.005 @ 15 in. Hg
Pitots ✓ ✓ @ 4" in. Hg
Orsat NA

Orsat Meas.	Time	CO_2	O_2	CO	N_2
1					
2					
3					

Nozzle Cal	D_1	D_2	D_3	Average
	0.976	0.975	0.976	0.976

052

TOTAL COMBUSTION ANALYSIS

SCAQMD METHOD 25
FIELD SAMPLING DATA SHEET

Job #: W07-035
Facility: Bradley Landfill
Location: Sun Valley, CA
Date: 4-23-03
Operator: TW, CSM, SB

Control Device: Flare #1
Sample Location: Inlet
Ambient Temp.: 65°
Baro. Pressure: 29.17

SAMPLE A

Tank #: A **Trap #:** R
Initial Vacuum: 2.5 Torr/30"
Final Vacuum: 12"
Start Time: 10:12

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	30	~150
05	28½	
10	27	
15	25½	
20	24	
25	22½	
30	21	
35	19½	
40	18	
45	16½	
50	15	
55	13½	
60	12	~150

SAMPLE B

Tank #: D **Trap #:** O
Initial Vacuum: 2.5 Torr/30"
Final Vacuum: 12"
End Time: 11:12

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	30	~150
05	28½	
10	27	
15	25½	
20	24	
25	22½	
30	21	
35	~~20½~~ 19½	
40	18	
45	16½	
50	15	
55	13½	
60	12	~150

LEAK RATE

Pre Test : ✓ ✓ TW
Post Test: ✓ ✓ CSM

SCAQMD METHOD 25
FIELD SAMPLING DATA SHEET

Job #: W07-035
Facility: BRADLEY LANDFILL
Location: SUN VALLEY, CA
Date: 4-23-03
Operator: CSM, TW, SB

Control Device: FLARE #1
Sample Location: OUTLET
Ambient Temp.: 65°
Baro. Pressure: _____

SAMPLE A

Tank #: S12 **Trap #:** H211
Initial Vacuum: 3.8 TORR
Final Vacuum: 6 in Hg
Start Time: 10:14

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	30	SET
05	28	↓
10	26	
15	24	
20	22	
25	20	
30	18	
35	16	
40	14	
45	12	
50	10	
55	8	
60	6	✓

SAMPLE B

Tank #: S16 **Trap #:** H212
Initial Vacuum: 3.8 TORR
Final Vacuum: 6 in Hg
End Time: 11:14

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	30	SET
05	28	↓
10	26	
15	24	
20	22	
25	20	
30	18	
35	16	
40	14	
45	12	
50	10	
55	8	
60	6	✓

LEAK RATE

Pre Test : ✓ / ✓
Post Test: ✓ / ✓

OCO

INTEGRATED BAG SAMPLING DATA FORM

Run Number: 1

Date: 4/23/03 Plant: BRADLEY LANDFILL

Sampling Location: FLARE #1 OUTLET

Barometric Pressure: 29.17

Ambient Temp. °C: 65°F Stack Temp. °C: 1600°F

Operator: CSM

Start 1012

Time	Traverse Point	A Rate Meter Flow Rate (Q), $cm^3/min.$	B Rate Meter Flow Rate (Q), $cm^3/min.$	% Dev.[a]
00	SING/C	67	67	0
10		67	67	0
20		67	67	0
30		67	67	0
40		67	67	0
50		67	67	0
60		67	67	0
			Avg. =	

a

$$\%\ Dev. = \left(\frac{Q - Q_{avg}}{Q_{avg}}\right) 100;\ must\ be \le 10\%$$

H:\WPDOCS\FORMS\Integrated Bag Sampling Form.wpd

CEM TEMPERATURE DATA

Facility: BRADLEY LANDFILL

Job No.: WO7-035

Source: FLARE #1

Date: 4/23/03

Run #: 1, 2

Probe Temp Settings: >250°F

Heated Line Temp Settings: >250°F

		TEMPERATURES °F		
	Time	Condenser Outlet	Probe	Teflon Line
1	R1 00	35	>250	>250
2	10	35		
3	20	36		
4	30	35		
5	40	35		
6	50	35		
7	60	35		
8	R2 00	35		
9	10	35		
10	20	35		
11	30	35		
12	40	35		
13	50	35		
14	60	35		
15				

SAMPLE TRAIN REQUEST/CHAIN OF CUSTODY FORM
SCAQMD Method 4, 5, 6, 12
Multiple Metals, Semi Volatiles, Acids

Method(s): SCAQMD 5.1 No. Trains/Method: 2

Client: BRADLEY L.F. / Waste Management Source Test Date: 04-23-03

Job #: W07.035 Date Needed: 04-22-03

Requested by: SB Prepared by: [signature]

PROBE ID	JUMPER ID	IMPINGERS TRAIN ID	FILTER HOLDER ID	RUN #	SOURCE ID
	C3	C3	C3 (G00200)	1	
	C11	C11	C11 (G00198)	2	

Relinquished by: [signature] Date: 04.22.03 Time: 1700

Relinquished to: [signature] Date: 4/22/03 Time: 1700

Relinquished by: [signature] Date: 4/23/03 Time: 2:00

Relinquished to: [signature] Date: 4-24-03 Time: 2:00 pm.

Relinquished by: _____ Date: _____ Time: _____

Relinquished to: _____ Date: _____ Time: _____

Relinquished by: _____ Date: _____ Time: _____

Relinquished to: _____ Date: _____ Time: _____

Sample Trains Recovered by: CH Date: 4-24-03

Sample Trains Received Intact: CH (initial) Impinger Train On Ice: CH (initial)

Sample Train Components Capped: CH (initial)

APPENDIX E - Calibration Information

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS

CUSTOMER HORIZON AIR MEASUREMENTS

DATE 11/21/02

P.O NUMBER 8557

REF. NUMBER 73184900

REQUESTED COMPOSITION

GAS	CONCENTRATION
NITROGEN DIOXIDE (AS NOX)	19 ppm
AIR	BALANCE
ANALYTICAL ACCURACY	±2 %
NO	

ANALYTICAL METHOD

INSTRUMENT	ANALYTICAL PRINCIPLE
Thermo Env. 42H S/N 42H-44979-273	Chemiluminescence
Thermo Env. 42H S/N 42H-44979-273	Chemiluminescence

VALUES NOT VALID BELOW 150 PSIG.
SRM UNCERTAINTY ± 2 %
NOX CONC. LAST CERTIFIED ON 10-19-02 WAS 17.9 ppm.

THIS CYLINDER NO.	SA 15361
CYLINDER PRESSURE	1250 **PSIG**
EXPIRATION DATE	05-21-03
CLASSIFICATION	PRIMARY STANDARD
BATCH NUMBER	N/A
LOT NUMBER	109210507
PART NUMBER	EV AINX19MP-AS
CYLINDER SIZE	AS **CGA** 660 85 **CFT**

CERTIFIED CONCENTRATION

NITROGEN DIOXIDE (AS NOX)	18.1 ppm
AIR	BALANCE
ANALYTICAL ACCURACY	±2 %
NO	0.4 ppm

ANALYZED BY PHU TIEN NGUYEN

CERTIFIED BY TERESA GOMEZ

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR **P.O NUMBER**

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
NITRIC OXIDE GMIS	vs.SRM#2629	SA 18096	12.7 ppm

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. **COMPONENT** NITRIC OXIDE GMIS **ANALYZER MAKE-MODEL-S/N** Thermo Env. 42H S/N 42H-44979-273

ANALYTICAL PRINCIPLE Chemiluminescence **LAST CALIBRATION DATE** 09/09/02

FIRST ANALYSIS DATE 09/05/02 **SECOND ANALYSIS DATE** 09/13/02

Z -0.04	R 15.58	C 12.59	CONC. 10.27		Z -0.03	R 16.90	C 13.57	CONC. 10.20			
R 15.62	Z -0.04	C 12.58	CONC. 10.23		R 16.88	Z -0.03	C 13.50	CONC. 10.16			
Z -0.04	C 12.65	R 15.72	CONC. 10.23		Z -0.03	C 13.57	R 16.85	CONC. 10.23			
U/M ppm		MEAN TEST ASSAY	10.24 ppm		U/M ppm			MEAN TEST ASSAY	10.20 ppm		

NOx values for reference only.
All values not valid below 150 psig.

THIS CYLINDER NO. CC 150046
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121
OF TRACEABILITY PROTOCOL NO. Rev. 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 **% NIST TRACEABLE**
CYLINDER PRESSURE 2000 **PSIG**
CERTIFICATION DATE 09/13/02
EXPIRATION DATE 09/13/04 **TERM** 24 MONTHS

CERTIFIED CONCENTRATION

NITRIC OXIDE	10.2 ppm
NITROGEN	BALANCE
NOx	10.4 ppm

ANALYZED BY PHU TIEN NGUYEN

CERTIFIED BY ELIZA GOMEZ

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR **P.O NUMBER**

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
NITRIC OXIDE GMIS	vs.SRM#1683	CC 95448	22.4 ppm

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. **COMPONENT** NITRIC OXIDE GMIS **ANALYZER MAKE-MODEL-S/N** Thermo Env. 42H S/N 42H-44979-273

ANALYTICAL PRINCIPLE Chemiluminescence **LAST CALIBRATION DATE** 08/09/02

FIRST ANALYSIS DATE 08-20-02 **SECOND ANALYSIS DATE** 08-27-02

Z 0	R 22.6	C 21.0	CONC. 20.8		Z 0.0	R 22.66	C 21.02	CONC. 20.8	
R 22.5	Z 0	C 21.0	CONC. 20.9		R 22.65	Z 0.0	C 21.03	CONC. 20.8	
Z 0	C 21.1	R 22.7	CONC. 20.8		Z 0.0	C 21.03	R 22.67	CONC. 20.8	
U/M ppm		MEAN TEST ASSAY 20.8			U/M ppm			MEAN TEST ASSAY 20.8	

NOx values for reference only.
All values not valid below 150 psig.

THIS CYLINDER NO. SA 7833
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121
OF TRACEABILITY PROTOCOL NO. Rev. 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 **% NIST TRACEABLE**
CYLINDER PRESSURE 2000 **PSIG**
CERTIFICATION DATE 08/27/02
EXPIRATION DATE 08/27/04 **TERM** 24 MONTHS

CERTIFIED CONCENTRATION

NITRIC OXIDE	20.8 ppm
NITROGEN	BALANCE
NOx	21.0 ppm

ANALYZED BY PHU TIEN NGUYEN

CERTIFIED BY MICHAEL TSANG

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR **P.O NUMBER**

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON MONOXIDE GMIS	vs.SRM#1689	SA 18494	50.0 ppm
NITRIC OXIDE GMIS	vsSRM#1683b	SA 10788	48.61 ppm

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. COMPONENT CARBON MONOXIDE GMIS **ANALYZER MAKE-MODEL-S/N** Siemens Ultramat 5E S/N A12-729

ANALYTICAL PRINCIPLE NDIR **LAST CALIBRATION DATE** 11/14/02

FIRST ANALYSIS DATE 07/23/02 **SECOND ANALYSIS DATE** 11/21/02

Z 0.0	R 50.6	C 50.3	CONC. 50.3		Z 0.0	R 50.0	C 50.6	CONC. 50.6			
R 50.6	Z 0.0	C 50.3	CONC. 50.3		R 50.0	Z 0.0	C 50.6	CONC. 50.6			
Z 0.0	C 50.3	R 50.6	CONC. 50.3		Z 0.0	C 50.6	R 50.0	CONC. 50.6			
U/M ppm		MEAN TEST ASSAY 50.3 ppm			U/M ppm			MEAN TEST ASSAY 50.6 ppm			

2. COMPONENT NITRIC OXIDE GMIS **ANALYZER MAKE-MODEL-S/N** Beckman 951A S/N 0101354

ANALYTICAL PRINCIPLE Chemiluminescence **LAST CALIBRATION DATE** 11/08/02

FIRST ANALYSIS DATE 07/23/02 **SECOND ANALYSIS DATE** 11/21/02

Z 0.0	R 429.0	C 417.2	CONC. 50.2		Z 0.0	R 428.0	C 438.3	CONC. 49.8			
R 427.9	Z 0.0	C 416.7	CONC. 50.2		R 427.6	Z 0.0	C 437.9	CONC. 49.8			
Z 0.0	C 416.0	R 429.8	CONC. 49.9		Z 0.0	C 436.6	R 426.5	CONC. 49.8			
U/M mV		MEAN TEST ASSAY 50.1			U/M mV			MEAN TEST ASSAY 49.8 ppm			

Values not valid below 150 psig.
NOx values for reference use only.
FIRST ANALYSIS OF CO USED GMIS# SA 17996 & NO USED NO GMIS# SA 13019.

THIS CYLINDER NO. SA 8852
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121
OF TRACEABILITY PROTOCOL NO. Rev. 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 **% NIST TRACEABLE**
CYLINDER PRESSURE 2000 **PSIG**
CERTIFICATION DATE 11/21/02
EXPIRATION DATE 11/21/04 **TERM** 24 MONTHS

CERTIFIED CONCENTRATION

CARBON MONOXIDE	50.4 ppm
NITRIC OXIDE	50.0 ppm
NITROGEN	BALANCE
NOx	50.1 ppm

ANALYZED BY CHRIS VU ***CERTIFIED BY*** EDGAR CUEVAS

PRAXAIR
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR MEASUREMENT **P.O NUMBER**

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON MONOXIDE GMIS	vs.SRM#1679	CC 43032	99.1 ppm
NITRIC OXIDE GMIS	vsSRM1684b	SA 21535	100.3 ppm

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. COMPONENT CARBON MONOXIDE GMIS **ANALYZER MAKE-MODEL-S/N** Siemens Ultramat 5E S/N A12-729

ANALYTICAL PRINCIPLE NDIR **LAST CALIBRATION DATE** 01/09/03

FIRST ANALYSIS DATE 01/15/03 **SECOND ANALYSIS DATE** 01/21/03

Z 0.0	R 99.1	C 79.3	CONC. 79.3		Z 0.0	R 99.1	C 79.2	CONC. 79.2			
R 99.1	Z 0.0	C 79.3	CONC. 79.3		R 99.1	Z 0.0	C 79.2	CONC. 79.2			
Z 0.0	C 79.3	R 99.1	CONC. 79.3		Z 0.0	C 79.2	R 99.1	CONC. 79.2			

U/M ppm **MEAN TEST ASSAY** 79.3 ppm **U/M** ppm **MEAN TEST ASSAY** 79.2 ppm

2. COMPONENT NITRIC OXIDE GMIS **ANALYZER MAKE-MODEL-S/N** Beckman 951A S/N 0101354

ANALYTICAL PRINCIPLE Chemiluminescence **LAST CALIBRATION DATE** 01/08/03

FIRST ANALYSIS DATE 01/15/03 **SECOND ANALYSIS DATE** 01/21/03

Z 0.0	R 887.5	C 707.1	CONC. 79.9		Z 0.0	R 888.7	C 709.1	CONC. 80.0			
R 888.5	Z 0.0	C 708.5	CONC. 80.0		R 890.9	Z 0.0	C 708.6	CONC. 79.7			
Z 0.0	C 709.6	R 889.8	CONC. 80.0		Z 0.0	C 708.1	R 888.1	CONC. 80.0			

U/M mV **MEAN TEST ASSAY** 80.0 ppm **U/M** mV **MEAN TEST ASSAY** 79.9 ppm

Values not valid below 150 psig.
NOx values for reference use only.

THIS CYLINDER NO. CC 157902
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121
OF TRACEABILITY PROTOCOL NO. Rev. 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 **% NIST TRACEABLE**
CYLINDER PRESSURE 2000 **PSIG**
CERTIFICATION DATE 01/21/03
EXPIRATION DATE 01/21/05 **TERM** 24 MONTHS

CERTIFIED CONCENTRATION

CARBON MONOXIDE	79.2 ppm
NITRIC OXIDE	80.0 ppm
NITROGEN	BALANCE
NOx	80.0 ppm

ANALYZED BY CHRIS VU ***CERTIFIED BY*** EDGAR CUEVAS

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS

CUSTOMER HORIZON AIR MEASUREMENTS

DATE 03/31/03

P.O NUMBER 8156

REF. NUMBER 89360800

REQUESTED COMPOSITION

GAS	CONCENTRATION
CARBON DIOXIDE	7%
OXYGEN	12%
NITROGEN	BALANCE
ANALYTICAL ACCURACY	± 1 %

ANALYTICAL METHOD

INSTRUMENT	ANALYTICAL PRINCIPLE
METTLER ID5, S/N:1865166	GRAVIMETRIC
METTLER ID5, S/N:1865166	GRAVIMETRIC

VALUES NOT VALID BELOW 150 PSIG.

THIS CYLINDER NO.	CC 163394
CYLINDER PRESSURE	2000 **PSIG**
EXPIRATION DATE	03/28/06
CLASSIFICATION	PRIMARY STANDARD
BATCH NUMBER	N/A
LOT NUMBER	109308406
PART NUMBER	EV NICDOXP1-AS
CYLINDER SIZE	AS **CGA** 590 148 **CFT**

CERTIFIED CONCENTRATION

CARBON DIOXIDE	7.00%
OXYGEN	12.01%
NITROGEN	BALANCE
ANALYTICAL ACCURACY	± 1 %

ANALYZED BY EDGAR CUEVAS

CERTIFIED BY PHU TIEN NGUYEN

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS

CUSTOMER HORIZON AIR

DATE 08/27/02

P.O NUMBER

REF. NUMBER 00874800

REQUESTED COMPOSITION

GAS	CONCENTRATION
CARBON DIOXIDE	12 %
NITROGEN	BALANCE
ANALYTICAL ACCURACY ±1 %	

ANALYTICAL METHOD

INSTRUMENT	ANALYTICAL PRINCIPLE
METTLER ID5, S/N:1865166	GRAVIMETRIC

VALUE NOT VALID BELOW 150 PSIG.

THIS CYLINDER NO.	SA 2515
CYLINDER PRESSURE	2000 **PSIG**
EXPIRATION DATE	08/27/05
CLASSIFICATION	PRIMARY STANDARD
BATCH NUMBER	N/A
LOT NUMBER	109223508
PART NUMBER	EV NICD12P-AS
CYLINDER SIZE	AS **CGA** 580 143 **CFT**

CERTIFIED CONCENTRATION

CARBON DIOXIDE	12.01 %
NITROGEN	BALANCE
ANALYTICAL ACCURACY ±1 %	

ANALYZED BY JOSEPH CHARLES

CERTIFIED BY TY TRIPLETT

Magnehelic Gauge Calibration Data

Range: 0.0-1.0

Date: 02/17/03

Calibrated by: Travis Williams

BAROMETRIC PRESURE: 29.40

Reference: 0.0-10.0" MANOMETER

SYSTEM
LEAK CHECKS (Y/N): Y

POINT
LEAK CHECK (Y/N): Y

Magnahelic Box # 1

Serial # R970865M62

MAG	MAN R1	MAN R2	MAN R3	MEAN	MEAN/MAG
0.20	0.20	0.20	0.20	0.200	0.998
0.40	0.40	0.40	0.40	0.400	0.999
0.60	0.60	0.60	0.60	0.599	0.999
0.80	0.80	0.80	0.80	0.800	1.000
1.00	1.00	1.00	1.00	1.000	1.000

Correction Factor: 0.9992

Date: 02.17.03

Checked by:

STACK TEMPERATURE SENSOR CALIBRATION DATA- APEX PROBE ASSEMBLIES

Date: 01/30/03
Calibrated by: Travis Williams

THERMOCOUPLE ID:

	ICE WATER						ABSOLUTE T DIFF., %			BOILING WATER						ABSOLUTE T DIFF., %			BOILING OIL						ABSOLUTE T DIFF., %		
	REF			TC						REF			TC						REF			TC					
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Stainless Steel Probes																											
4-2	32	32	32	32	32	31	0.0	0.0	0.2	212	212	212	212	212	213	0.0	0.0	-0.1	539	539	538	540	540	539	-0.1	-0.1	-0.1
4-3	32	32	32	32	32	33	0.0	0.0	-0.2	212	211	211	211	211	211	0.1	0.0	0.0	369	369	369	369	369	369	0.0	0.0	0.0
6-2	32	32	32	33	33	32	-0.2	-0.2	0.0	211	212	212	212	212	212	-0.1	0.0	0.0	370	370	370	370	369	370	0.0	0.1	0.0
6-3	32	32	32	33	32	32	-0.2	0.0	0.0	212	212	212	213	213	213	-0.1	-0.1	-0.1	536	536	536	536	536	537	0.0	0.0	-0.1
6-4	32	32	32	32	32	32	0.0	0.0	0.0	211	212	212	211	212	212	0.2	0.0	0.0	369	369	369	369	369	370	0.0	0.0	-0.1
A8-5	32	32	32	32	33	33	0.0	-0.2	-0.2	212	212	212	212	212	213	0.0	0.0	-0.1	535	535	535	534	535	535	0.1	0.0	0.0
A8-1	32	32	32	33	33	32	-0.2	-0.2	0.0	212	212	212	213	213	213	-0.1	-0.1	-0.1	540	540	540	540	540	540	0.0	0.0	0.0
A8-2	32	32	32	33	33	32	-0.2	-0.2	0.0	212	212	212	212	212	213	0.0	0.0	-0.1	541	542	542	541	542	541	0.0	0.0	0.1
10-1	32	32	32	32	32	32	0.0	0.0	0.0	212	212	212	212	212	212	0.0	0.0	0.0	540	539	539	540	540	539	0.0	-0.1	0.0
Inconel																											
10-2 Inc	32	32	32	33	33	33	-0.2	-0.2	-0.2	212	212	212	213	213	213	-0.1	-0.1	-0.1	542	542	542	541	541	542	0.1	0.1	0.0
6-1 Inc	32	32	32	33	33	32	-0.2	-0.2	0.0	212	212	212	213	213	213	-0.1	-0.1	-0.1	541	541	540	541	541	540	0.0	0.0	0.0
Loose Thermocouple																											
6-5L	32	32	32	33	32	32	-0.2	0.0	0.0	212	212	212	212	212	213	0.0	0.0	-0.1	540	540	540	539	540	541	0.1	0.0	-0.1
7-1L	32	32	32	32	31	32	0.0	0.2	0.0	212	212	212	212	213	213	0.0	-0.1	-0.1	540	540	540	539	539	539	0.1	0.1	0.1
M17-1	32	32	32	33	33	32	-0.2	-0.2	0.0	212	212	212	211	212	212	0.1	0.0	0.0	370	370	369	369	369	369	0.1	0.1	0.0
3-1	32	32	32	32	32	32	0.0	0.0	0.0	212	212	212	212	213	212	0.0	-0.1	0.0	540	540	540	539	540	540	0.1	0.0	0.0
5-1	32	32	32	32	32	32	0.0	0.0	0.0	212	212	212	213	213	212	-0.1	-0.1	0.0	540	540	540	540	540	541	0.0	0.0	-0.1
7-2	32	32	32	31	31	32	0.2	0.2	0.0	212	212	212	211	211	211	0.1	0.1	0.1	524	524	525	525	525	526	-0.1	-0.1	-0.1
6-7	32	32	32	32	32	32	0.0	0.0	0.0	212	212	212	212	212	212	0.0	0.0	0.0	535	535	535	535	534	535	0.0	0.1	0.0
6-8	32	32	32	32	32	31	0.0	0.0	0.2	212	212	212	212	212	213	0.0	0.0	-0.1	521	521	521	520	520	521	0.1	0.1	0.0
6-3	32	32	32	32	32	31	0.0	0.0	0.2	212	212	212	211	211	212	0.1	0.1	0.0	514	514	514	514	514	513	0.0	0.0	0.1

Note: If absolute temperature values of the reference thermometer being calibrated and the stack temperature sensors agree within 1.5 percent at each of the three calibration points, no correction is needed.

073

Control Box Calibration Data

Date: 01/29/03

Calibrated by: FJOTorres

Meter Box Number: 4

Barometric Pressure: 29.31

Wet Test Meter Cf: 1.0013

Orifice setting (H)	Gas Volumes: Wet Test (cu.ft)	Gas Volumes: Dry Gas Initial (cu.ft)	Gas Volumes: Dry Gas Final (cu.ft)	Temperatures: DGM Initial (°F)	Temperatures: DGM final (°F)	Temperatures: WTM (°F)	Time (min)	Y	H@
0.5	6.200	719.365	725.627	69	70	71	15	0.9873	1.6812
1.0	5.788	737.182	743.028	70	71	71	10	0.9870	1.7131
1.5	10.335	725.907	736.320	69	71	71	15	0.9877	1.8142
2.0	18.346	680.992	699.487	71	73	71	23	0.9892	1.7989
3.0	14.536	666.152	680.763	69	73	71	15	0.9883	1.8307
4.0	19.350	646.527	665.885	65	72	71	17	0.9858	1.7777
						AVERAGE		0.9876	1.7693

Reviewed by: R. Vackenot

Control Box Calibration Data

Date: 02/05/03

Calibrated by: FJOTorres

Meter Box Number: 5

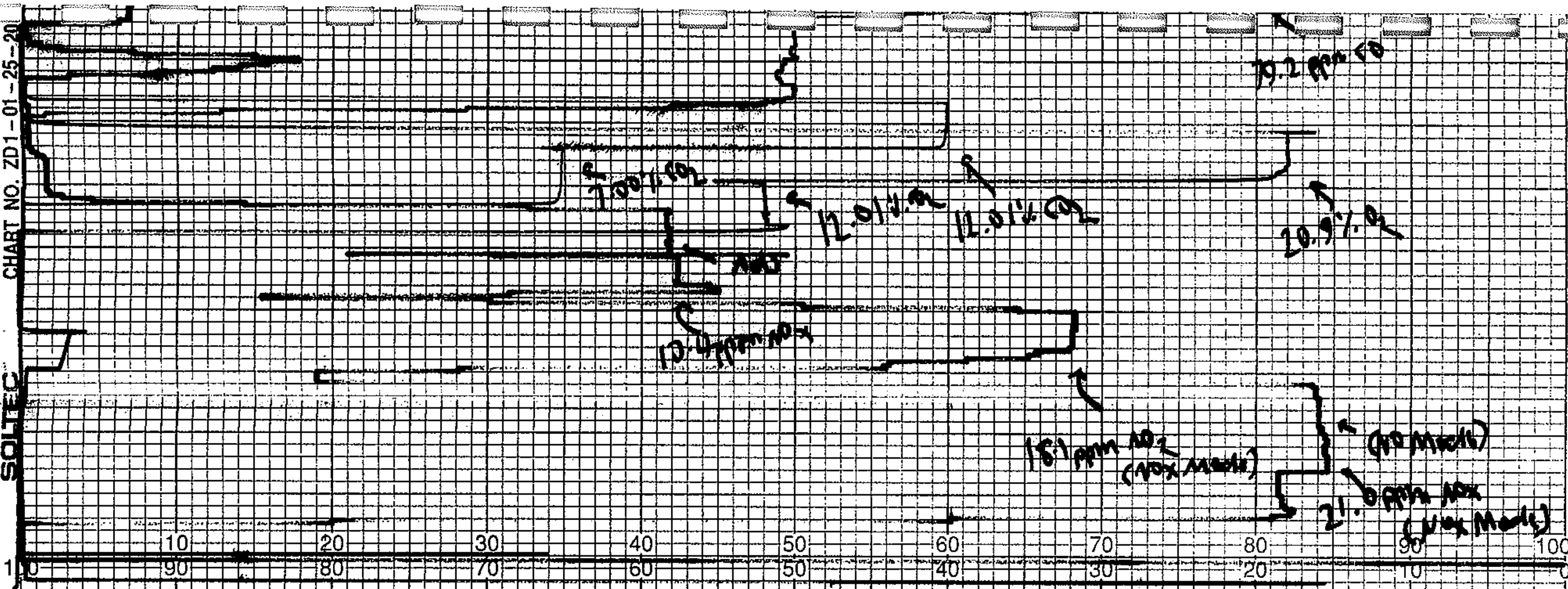
Barometric Pressure: 29.30

Wet Test Meter Cf: 1.0013

Orifice setting (H)	Gas Volumes: Wet Test (cu.ft)	Gas Volumes: Dry Gas Initial (cu.ft)	Gas Volumes: Dry Gas Final (cu.ft)	Temperatures: DGM Initial (°F)	Temperatures: DGM final (°F)	Temperatures: WTM (°F)	Time (min)	Y	H@
0.5	7.054	436.875	444.083	67	76	65	17	0.9903	1.6258
1.0	19.763	504.138	524.342	69	77	66	34	0.9891	1.6595
1.5	13.236	524.559	538.157	77	80	67	19	0.9913	1.7218
2.0	16.216	474.603	491.257	73	79	66	20	0.9876	1.6962
3.0	11.951	461.997	474.270	71	78	66	12	0.9829	1.6903
4.0	16.120	445.166	461.642	69	77	66	14	0.9824	1.6908
						AVERAGE		0.9873	1.6807

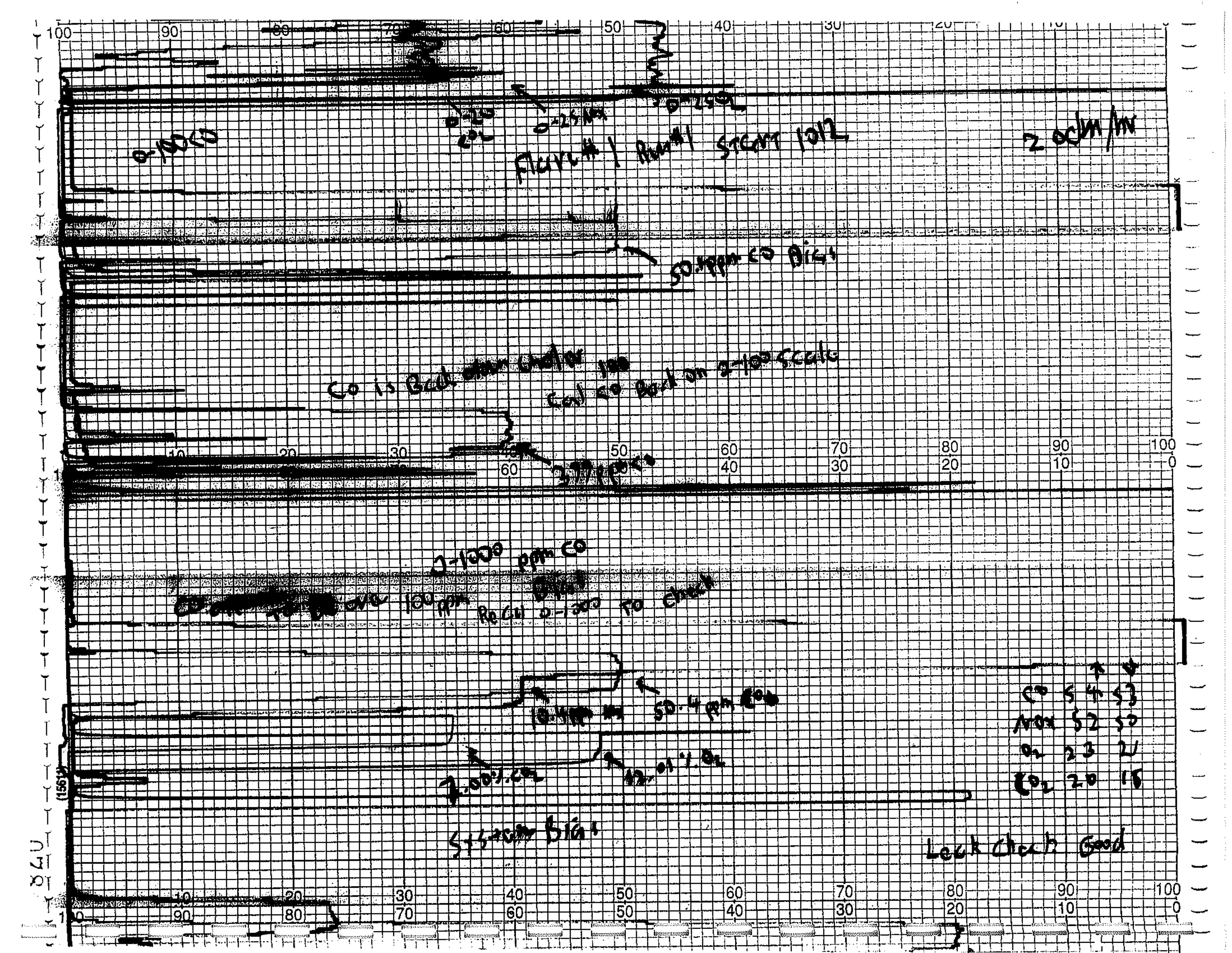
Reviewed by:

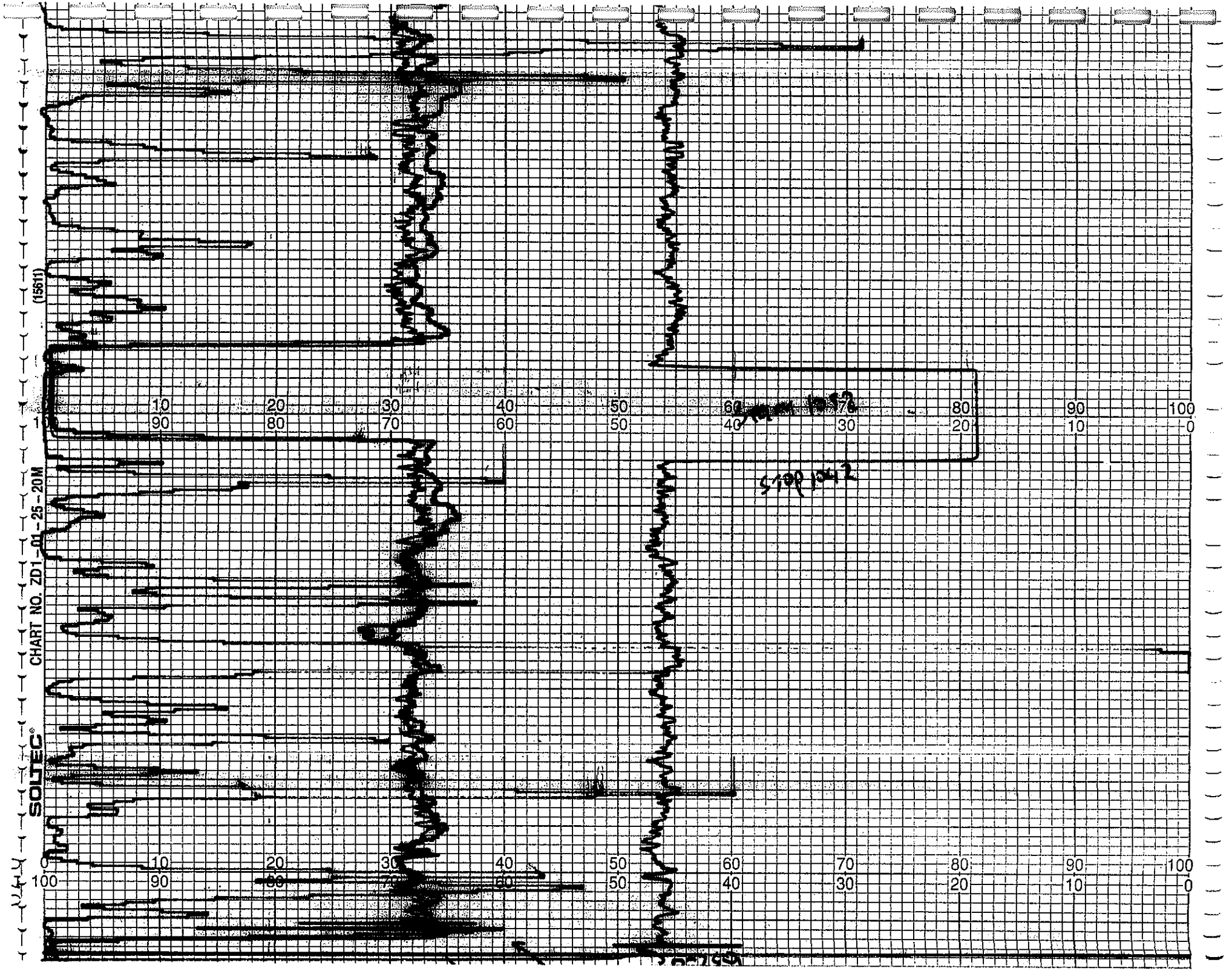
APPENDIX F - Strip Chart Data

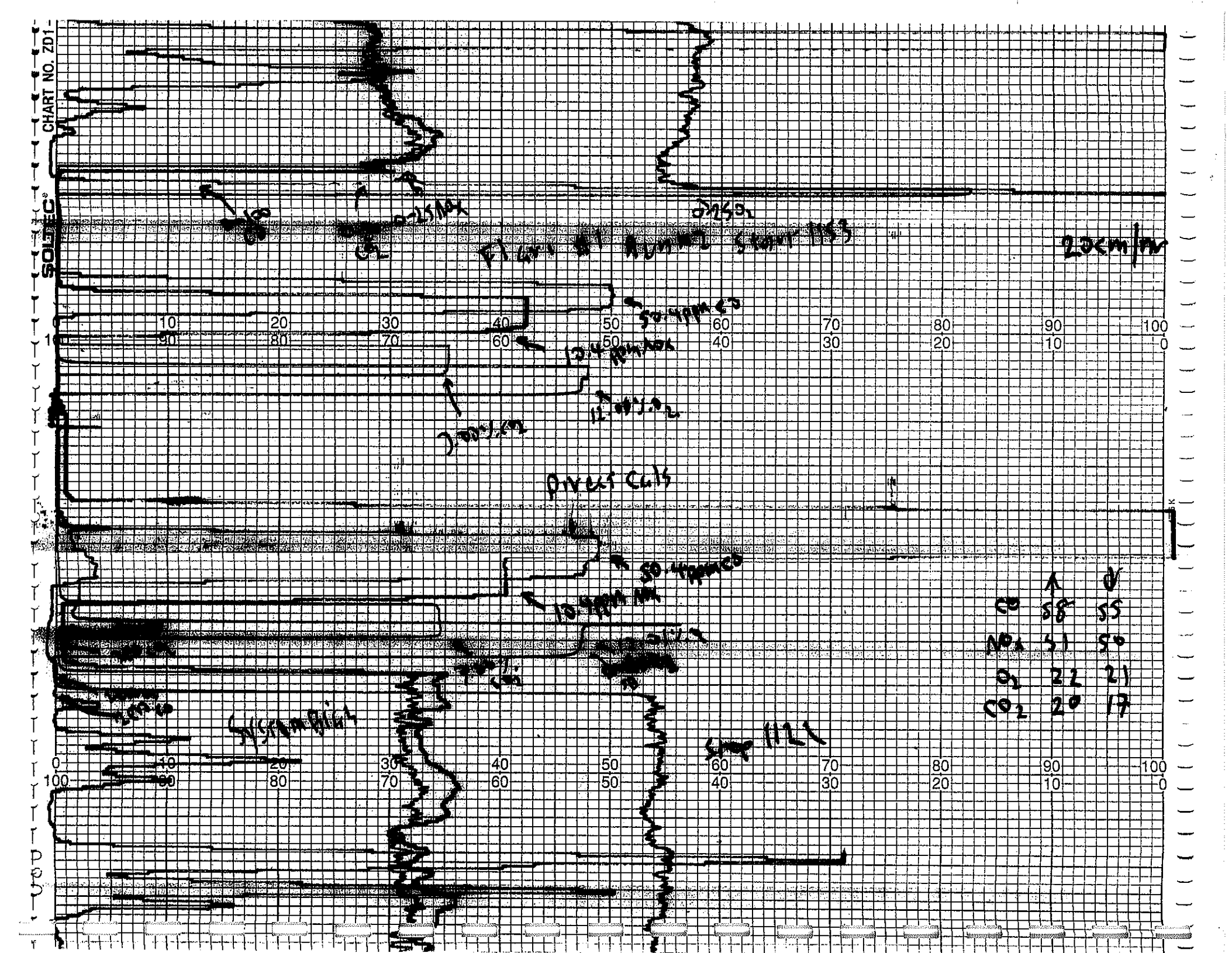


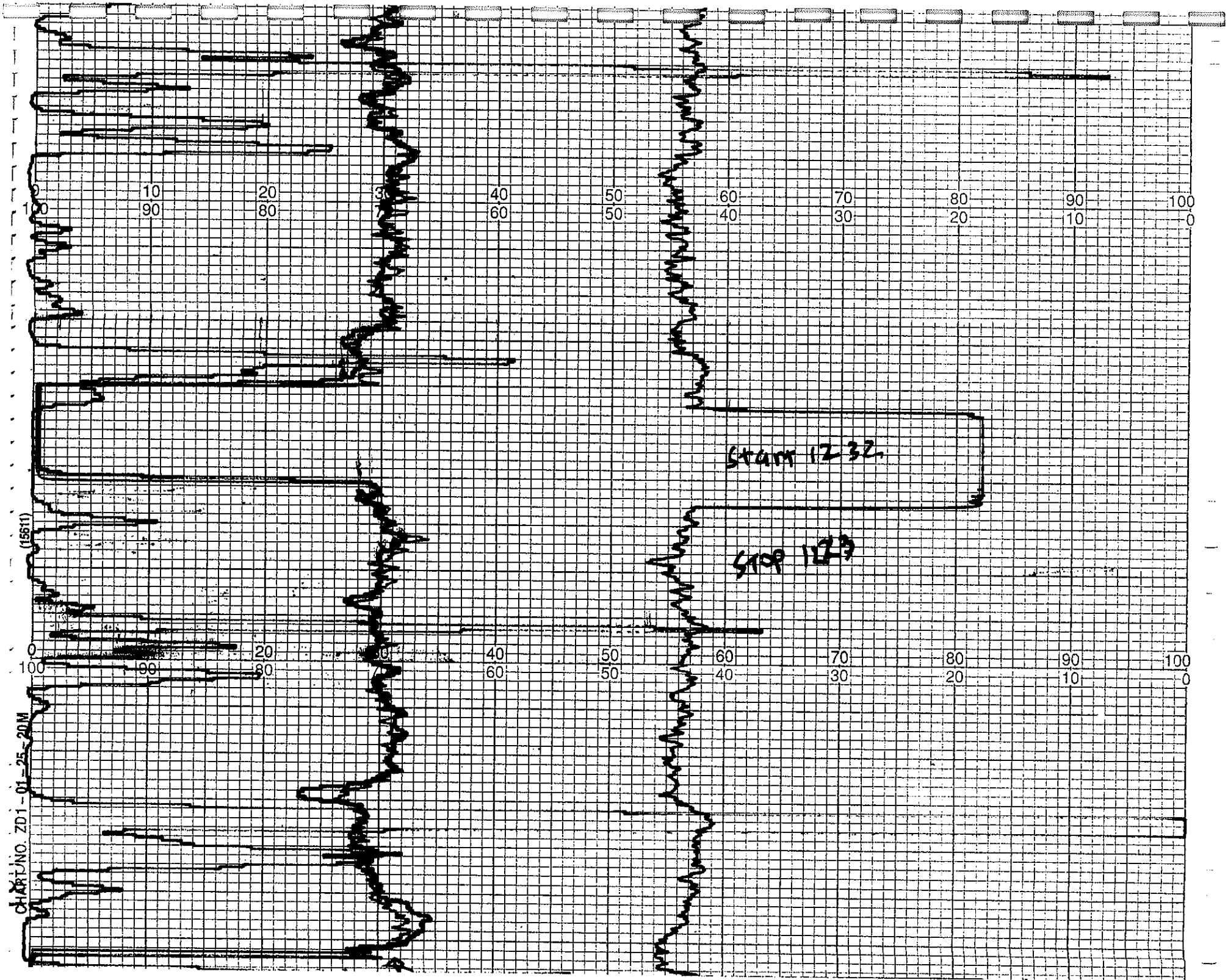
W07-039
Waste Management
Bradley LF
Flare #1 comp
Sun Valley, CA
4/23/03 BI SB, TM, CSM

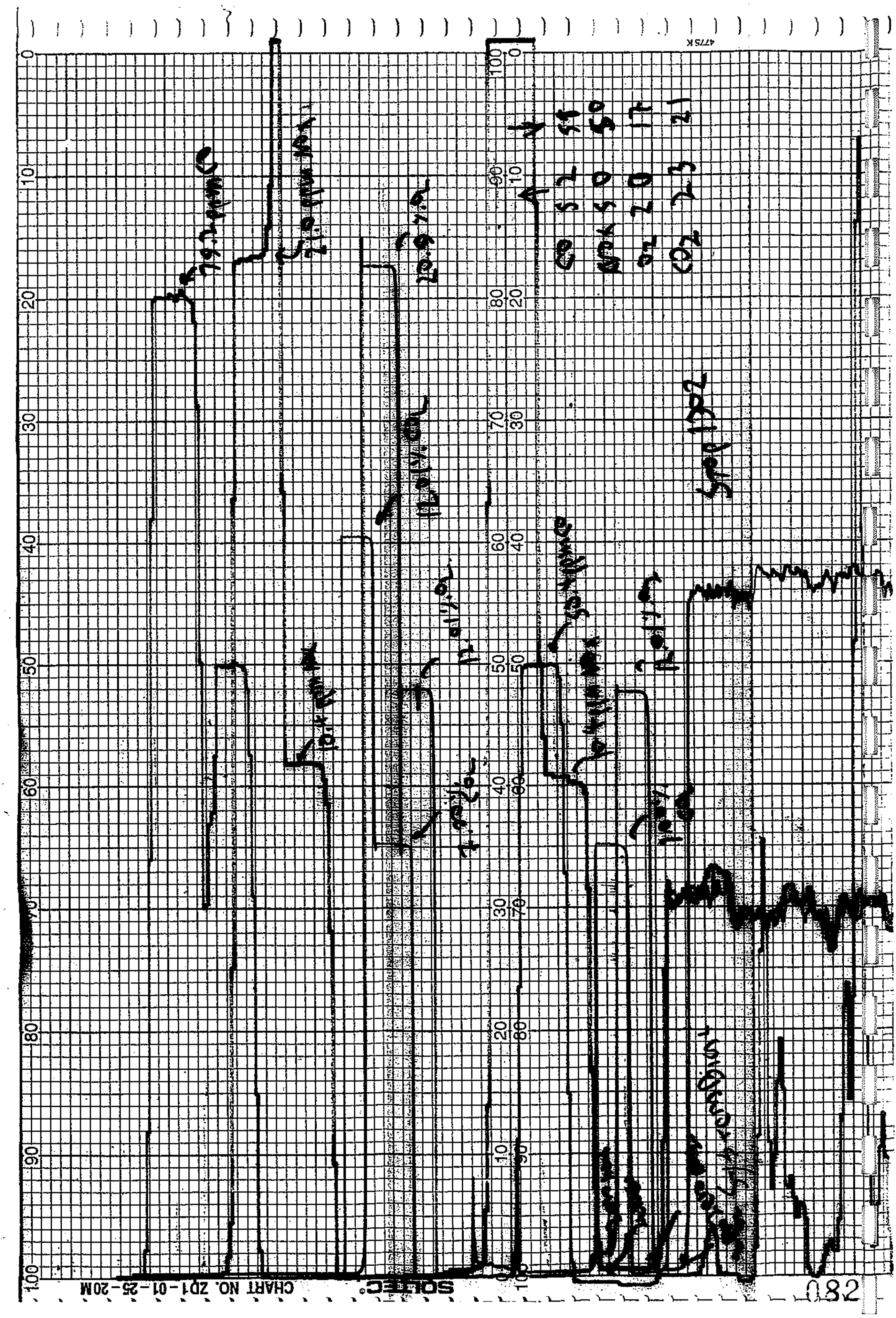
15.1 ppm NO2 (as NO2) - SA 15381
154 ppm NOx - CC150046
21.0 ppm NOx - SA 7833
50.4 ppm CO / 50.1 ppm NOx - SA 8852
79.2 ppm CO / 80.0 ppm NOx - CC 157902
7.00 % CO2 / 12.01 % O2 - CC 163394
12.01 % CO2 - SA 2515


2 scfm/hr
0-100 CO
Flare #1 Run #1 Start 1012
50 ppm CO Bias
CO is Back on 0-100 scale
Cal CO Back on 0-100 scale
0-1000 ppm CO
Leak Check Good
CO 54 53
NOx 52 50
O2 23 21
CO2 20 18


SOLTEC®
CHART NO. ZD1-01-25-20M
(15611)
10 90
20 80
30 70
40 60
50 50
60 40
70 30
80 20
90 10
100 0
0 100


SOLTEC
CHART NO. ZD1-
2.5cm/hr
0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0
CO 58 55
NO 51 50
O2 22 21
CO2 20 17


Start 12:32
Stop 12:43
CHART NO. ZD1-01-25-20M
(15611)


SOLTEC
CHART NO. ZD1-01-25-20M
4775K
CO 52 55
NOx 50 50
CO2 23 21
082

APPENDIX G - Process Data

OPERATING DATA
FOR LANDFILL FLARES

Facility: Bradley Landfill
Job No.: W07-035
Source: Flare #1

Date: 4/23/03
Run #: 1, 2

Time	Landfill Gas Flow (SCFM)	Condensate Injection (GPM)	Flare Temerature (°F)	Fuel Pressure ( )	Fuel Temp (°F)
Run#1					
1015	3567	3.5	1656	NA	NA
1025	3605	3.5	1640		
1035	3611	3.5	1652		
1045	3591	3.5	1649		
1055	3624	3.5	1650		
1105	3658	3.5	1619		
Run#2					
1200	3642	3.5	1646		
1210	3640	3.5	1621		
1220	3627	3.5	1630		
1230	3618	3.5	1634		
1240	3642	3.5	1654		
1250	3635	3.5	1629		
	3,621	3.5	1,640		

APPENDIX H - Permit to Operate

AQMD

PERMIT TO CONSTRUCT

Application No. ~~370136~~

Received 9/22/00

Granted as of 9/12/2000

ID 050310

LEGAL OWNER OR OPERATOR: BRADLEY LANDFILL AND RECYCLING CENTER
9081 TUJUNGA AVE P O BOX 39
SUN VALLEY, CA. 91352

Equipment Location: 9227 TUJUNGA AVE, SUN VALLEY, CA 91352-1542

Equipment Description:

LANDFILL GAS FLARING SYSTEM NO. 1 CONSISTING OF:

1. LIQUID KNOCKOUT/PARTICULATE REMOVAL VESSEL, JOHN ZINK, 2'-6" DIA. X 6'-0" H.
2. TWO BLOWERS, ONE STANDBY, LANDFILL GAS, EACH 200 HP, EACH 5,556 SCFM MAXIMUM FLOW RATE.
3. FLARE NO. 1, JOHN ZINK, 13'-0" DIA. X 60'-0" H., WITH A MULTI-JET BURNER, A PROPANE GAS PILOT, ELECTRIC IGNITER, UV FLAME SENSOR, THERMOCOUPLE WITH TEMPERATURE INDICATOR AND RECORDER, AUTOMATIC SHUTDOWN AND ALARM SYSTEM, AUTOMATIC COMBUSTION AIR REGULATING SYSTEM, TEMPERATURE CONTROLLER AND FLAME ARRESTOR.

Conditions:

1) OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.

2) THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.

3) THIS EQUIPMENT SHALL BE OPERATED AND MAINTAINED BY PERSONNEL PROPERLY TRAINED IN ITS OPERATION.

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4) THE START-UP FOR THIS FLARE SHALL NOT EXCEED 30 MINUTES. ANY OUTAGE THAT RESULTS IN THE SHUTDOWN OF THE FLARE OR GAS COMPRESSOR AND THE SUBSEQUENT START-UP OR RESTART OF THE FLARE OR THE COMPRESSOR IS NOT CONSIDERED A BREAKDOWN, PROVIDING NO RAW LANDFILL GAS EMISSIONS OCCUR.

5) THE FLARE SHALL BE EQUIPPED WITH A TEMPERATURE INDICATOR AND RECORDER WHICH MEASURES AND RECORDS THE GAS TEMPERATURE (IN DEGREES F) IN THE FLARE STACK. THE TEMPERATURE INDICATOR AND RECORDER SHALL OPERATE WHENEVER THE FLARE IS IN OPERATION.

6) WHENEVER THE FLARE IS IN OPERATION, A TEMPERATURE OF NOT LESS THAN 1500 DEGREES F, AS MEASURED BY THE TEMPERATURE INDICATOR SHALL BE MAINTAINED IN THE FLARE STACK EXCEPT DURING START-UP TIME FOR NOT MORE THAN 30 MINUTES. THE THERMOCOUPLE USED TO MEASURE THE TEMPERATURE SHALL BE ABOVE THE FLAME ZONE AND AT LEAST 3 FEET BELOW THE TOP OF THE FLARE SHROUD AND AT LEAST 0.6 SECONDS DOWNSTREAM OF THE BURNER.

7) THE FLARE SHALL BE EQUIPPED WITH A FAILURE ALARM WITH AN AUTOMATIC BLOWER AND LANDFILL GAS SUPPLY VALVE SHUT-OFF SYSTEM APPROVED BY THE AQMD, IN ORDER TO ISOLATE THE FLARE FROM THE LANDFILL GAS SUPPLY LINE, TO SHUT-OFF THE BLOWER AND TO NOTIFY A RESPONSIBLE PARTY OF THE FAILURE.

8) THE SHUT-OFF SAFETY SYSTEM SHALL BE TESTED ANNUALLY FOR PROPER OPERATION AND THE RESULTS RECORDED.

9) A FLOW INDICATING AND RECORDING DEVICE SHALL BE INSTALLED IN THE LANDFILL GAS SUPPLY LINE TO THE FLARE TO MEASURE AND RECORD THE QUANTITY OF LANDFILL GAS (IN SCFM) BEING BURNED.

10) ALL RECORDING DEVICES SHALL BE SYNCHRONIZED WITH RESPECT TO THE TIME OF DAY.

11) A PRESSURE DIFFERENTIAL INDICATOR SHALL BE MAINTAINED ACROSS THE FLAME ARRESTOR.

12) CONDENSATE INJECTED INTO THE FLARE SHALL NOT EXCEED 5 GPM.

13) THE TOTAL VOLUME OF LANDFILL GAS BURNED IN THE FLARE SHALL NOT EXCEED 5,556 STANDARD CUBIC FEET PER MINUTE.

14) EMISSIONS RESULTING FROM THE FLARE SHALL NOT EXCEED THE FOLLOWING:

POLLUTANT	LBS/HOUR
ROG	1.86
NOX (AS NO2)	10.0
SOX (AS SO2)	8.44
CO	33.3
PM10	3.0

ORIGINAL

15) EMISSIONS OF NOX FROM THE FLARE SHALL NOT EXCEED 0.06 LBS PER MILLION BTU OF HEAT.

16) A SUFFICIENT NUMBER OF SIGHT GLASS WINDOWS SHALL BE INSTALLED IN THE FLARE TO ALLOW VISUAL INSPECTION OF THE FLAME AND THERMOCOUPLE LOCATION WITHIN THE FLARE AT ALL TIMES. ADEQUATE AND SAFE ACCESS SHALL BE PROVIDED FOR ALL PORTS UPON REQUEST BY AQMD PERSONNEL.

17) A SET OF FOUR SAMPLING PORTS SHALL BE INSTALLED IN THE FLARE SHROUD AND LOCATED AT LEAST TWO FEET ABOVE THE FLAME ZONE AND AT LEAST THREE FEET BELOW THE TOP OF THE FLARE SHROUD. EACH PORT SHALL BE INSTALLED AT 90 DEGREES APART AND SHALL CONSIST OF FOUR INCH COUPLINGS. ADEQUATE AND SAFE ACCESS TO ALL TEST PORTS SHALL BE PROVIDED BY THE APPLICANT WITHIN 24 HOURS OF A REQUEST BY THE AQMD TO CONDUCT A TEST.

18) A SAMPLING PORT, OR OTHER METHOD APPROVED BY THE AQMD, SHALL BE INSTALLED AT THE INLET GAS LINE TO THE FLARE.

19) THE SKIN TEMPERATURE OF THE FLARE SHROUD WITHIN FOUR FEET OF ALL THE SOURCE TEST PORTS SHALL NOT EXCEED 250 DEGREES F. IF A HEAT SHIELD IS REQUIRED TO MEET THIS REQUIREMENT, ITS DESIGN SHALL BE APPROVED BY THE AQMD PRIOR TO CONSTRUCTION. THE HEAT SHIELD, IF REQUIRED TO MEET THE TEMPERATURE REQUIREMENT, SHALL BE IN PLACE WHENEVER A SOURCE TEST IS CONDUCTED BY THE AQMD.

20) THE APPLICANT SHALL CONDUCT A SOURCE TEST ANNUALLY OR PER THE APPROVED 1150.1 COMPLIANCE PLAN. THE TEST SHALL BE PERFORMED IN ACCORDANCE WITH AQMD APPROVED TEST PROCEDURES. THE TEST SHALL INCLUDE, BUT MAY NOT BE LIMITED TO, A TEST OF THE FLARE FOR:

A. LANDFILL GAS COMPOSITION AND HEATING VALUE (INLET)
B. LANDFILL GAS FLOW RATE, SCFM (INLET)
C. TOTAL SULFUR COMPOUNDS AS H2S, PPMV (INLET)
D. TEMPERATURE, F (EXHAUST)
E. FLOW RATE, DSCFM (EXHAUST)
F. NOX, LBS/HR AND LBS/MMBTU (EXHAUST)
G. SOX, LBS/HR (EXHAUST)
H. CO, LBS.HR (EXHAUST)
I. PM, LBS/HR AND GR/DSCF (EXHAUST)
J. TOTAL NON-METHANE ORGANICS, LBS/HR (INLET AND EXHAUST)
K. RULE 1150.1 TOXIC COMPOUNDS, PPMV (INLET AND EXHAUST)

THE SOURCE TEST SHALL BE CONDUCTED AT THE MAXIMUM FLOW RATE AVAILABLE AT THE TIME OF THE TEST BUT NOT TO EXCEED THE FLOW RATE ALLOWED BY THIS PERMIT.

21) ANY BREAKDOWN OR MALFUNCTION OF THE LANDFILL GAS FLARE RESULTING IN THE EMISSION OF RAW LANDFILL GAS SHALL BE REPORTED TO THE AQMD WITHIN ONE HOUR AFTER OCCURRENCE, AND IMMEDIATE REMEDIAL MEASURES SHALL BE UNDERTAKEN TO CORRECT THE PROBLEM AND PREVENT FURTHER EMISSIONS INTO THE ATMOSPHERE.

ORIGINAL

AQMD

PERMIT TO CONSTRUCT

Application No. 370136

22) ALL RECORDS SHALL BE KEPT FOR A PERIOD OF AT LEAST TWO YEARS AND SHALL BE MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST. A RECORD OF THE HOURS OF FLARE OPERATION SHALL BE INCLUDED.

Approval or denial of this application for permit to operate the above equipment will be made after an inspection to determine if the equipment has been constructed in accordance with the approved plans and specifications and if the equipment can be operated in compliance with all Rules of the South Coast Air Quality Management District.

Please notify TED KOWALCZYK at (909) 396-2592 when construction of equipment is complete.

This Permit to Construct is based on the plans, specifications, and data submitted as it pertains to the release of air contaminants and control measures to reduce air contaminants. No approval or opinion concerning safety and other factors in design, construction or operation of the equipment is expressed or implied.

This Permit to Construct shall serve as a temporary Permit to Operate provided the Executive Officer is given prior notice of such intent to operate.

This Permit to Construct will become invalid if the Permit to Operate is denied or if the application is cancelled. THIS PERMIT TO CONSTRUCT SHALL EXPIRE ONE YEAR FROM THE DATE OF ISSUANCE unless an extension is granted by the Executive Officer.

By Dorris M. Bailey
DORRIS M. BAILEY
Principal Office Assistant

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